

May 2006

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# digit

YOUR TECHNOLOGY NAVIGATOR



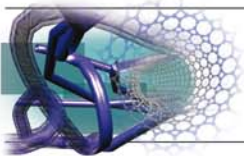
# SOUNDS GOOD!

## 49 of the best MP3 players!



Click here for the most fun you'll ever have online

One Game to Rule Them All!  
LOTR: **The Battle for Middle Earth**



**Nanotubes:** Silicon will soon pass on the baton

Cattle Management made easy **thanks to RFID**



Digging Deep: All you didn't know about Winamp

# Editorial

## Watch your Words on the Web

**B**E CAREFUL OF what you post online. The next time you bitch about someone on the Net or criticise your boss or principal or the President—watch it! Depending on what you post, you could lose out on that coveted job you're applying for, or lose the one you have. You could even land up in jail. Don't believe me? Read on:

Vikram Buddhi, an Indian grad student at Purdue University, was recently arrested and charged with threatening to kill George W Bush. Allegedly Buddhi, in various messages posted on a bulletin board, urged the site's readers to bomb the United States and rape American women. In some other messages he posted, he called for the killing of all Republicans. A concerned US citizen contacted the Secret Service office in Dallas to report Buddhi's ramblings on the Net. As of now, Buddhi and his lawyers are fighting for justice, thumping the First Amendment, which by American law assures freedom of speech.

Let's assume Buddhi did write what is alleged, which, of course, is highly objectionable. But aren't we usually frivolous when chatting on the Net? I mean, chat rooms and bulletin boards are the kind of places where you vent your emotions—however negative those may be, unwind after a hard day at work, and speak your mind—knowing (or believing) you won't be taken seriously. But this piece of news threatens to change that. You've now got to be careful about what you post online.

This brings me to what I'm trying to say here: Big Brother. OK, the phrase is clichéd and done to a dodo's death, but there are three things I'm talking about: freedom of speech, the way information travels on the Web, and the monitoring of your online actions. First, what has happened to the First Amendment? I thought you could say—at least in the US—what you wanted to. How can you arrest someone who hasn't *done anything*? Obviously, it's American post-9/11 paranoia that's at work here, which is evident from American blogs that are expressing satisfaction that something has been nipped in the bud. Second, remember that what you write online can conceivably be linked to by someone else and on and on—next thing you know, someone incriminates you out of context for something you don't even remember you posted. And third, you're being monitored. If not by the Secret Service, by job recruiters, for example.

What is increasingly becoming a trend these days amongst recruiters or HR officials is to dig deeper on



**Deepak Ajwani** Associate Editor

**“Ramblings in chat rooms  
and on bulletin boards can get you  
behind bars!”**

a potential candidate, with his or her résumé as a starting point. You may have been a college topper and rattled off big-ticket achievements during your previous job stints, but if your name pulls up incriminating stuff on a Google search, you're in for trouble. Be smart enough to not use your real name and other details that can identify you.

Companies can do a random background check on you. Be doubly sure that the information on your résumé matches your Web presence. If you blog, be careful of how much you share about your personal life. They're watching you. And god help you if you start slandering even a company you worked for three years ago.

People are today expressing themselves online more prolifically, and in more ways than before—it's a rising trend, as you know. But—need we say it again?—be careful of what you post online.

editor@thinkdigit.com

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**Disclaimer:** For every *Digit* contest, there will be only one winner, unless specified otherwise. In the event of a dispute, the Editor's decision shall be final

## Products Reviewed This Month

<b>Hardware</b>	ORITE Rock DJ	Creative Zen Neon	Zebronics ZEB-1400W
<b>MP3 players</b>	SAFA M800 Series (256 MB)	Creative Zen Vision	Zebronics ZEB-SW8000
<b>Flash based</b> .....	SAFA Q100	<b>PC Speakers</b>	<b>4.1 Speakers</b> .....
Bravish M 339	SAFA SR M850F	<b>2.1 Speakers</b> .....	119
Apple iPod Nano	Samsung Yepp YP-Z5	Altec Lansing 121i	Creative Inspire 4400
COWON iAUDIO U2	Samsung Yepp YP-D1	Altec Lansing ATP3	Frontech JIL-1867
Creative Muvo V200	Samsung YP C1	Altec Lansing CS21	Intex IT-2880SB
Creative Muvo N200	Samsung YP F1	Altec Lansing FX6021	<b>5.1 Speakers</b> .....
Creative Muvo N200 (512 MB)	Sony NW - E503	Altec Lansing MX-5021	128
Creative MuVo TX - FM (256 MB)	Sony NW - E307	Artis S-101	Altec Lansing GT-5051R
Creative MuVo TX - FM (512 MB)	Sony NW - E105	Artis S-111R	Artis S6600R
Creative MuVo TX - FM (512 MB)	Transcend T.Sonic 610	Artis S-700	Creative Inspire 5.1 5200
Creative MuVo-Slim (256 MB)	Transcend T.Sonic 310	Creative Inspire 2500	Creative Inspire GD580
Genius MP3 - DJ - 520 (256 MB)	UMAX Vega 107	Creative I-Trigue 3400	Frontech JIL-1875
mobiBLU DAH-220	XFREE XFL - 200	Creative SBS-370	Genius GHT-5200
mobiBLU DAH - 1500i	XFREE XFL - 200	Frontech JIL-1811	Intex IT-4900W
MSI MEGA STICK 528	XFREE XFL - 260	Genius sw-i2.1	Logitech Z-5500D
MSI Mega 515	YES YMP 920	Gigabyte GP-3A	Philips MMS 5.500 i/C
MSI .Mega Player 533 (8??) same as mega player 533 SD but no in built mem	YES YMP 921	Intex IT-2600WP	Philips HTR5000
MSI MEGA PLAYER 541	YES YMP 922	Logitech X-230	Tech-Com SSD-2001
MSI Mega Stick 520	YES YMP 901	Logitech Z-2300	Zebronics SW10000R
MSI MEGASTICK (256 MB)	YES YMP 928	Philips MMS171FM	Zebronics SW12000R
MSI 538	YES YMP 9	Philips MMS177FM	<b>New and Notable</b> .....
NU Dark Shadow	<b>Hard drive based</b> .....	Philips MMS430	76
	Apple iPod (Video)	Philips MMS5430	Canon Digital IXUS i zoom
	Sony NW-A1000	Tech-Com SSD-801	JVC Everio GZ-MG20e
	Sony NW-HD5	Tech-Com SSD-901R	ADATA FP1 USB 2.0
	Creative Zen Micro	Umax Powerbeats UPB 980	Plustek Opticslim M12
	Creative Zen MicroPhoto	Xfree XE222	ViewSonic G90F
		Xfree XE233	Canon IXUS 750

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## Enter



**16** Another deceptively pretty face—the geeky side of Sonali Kulkarni

**16** Will the terms of the General Public License kill 3D in Linux so soon after its birth? The Free Software Foundation is acting funny...

**24** The incredible weapon that is the rootkit

## Digital Passion



### **27 The Revolution Will Be Televised** 📺

Ye Olde TV will soon move beyond plain old cable—another one bites the Net!

### **30 A Physical Presence**

The CPU's responsibility in the quest for great gaming takes another cut—the Physics Processing Unit (PPU) will take a load off its mind

### **34 Move Over Silicon**

From sand to charcoal—as Silicon reaches the end of its long and illustrious career, Carbon Nanotubes will take over the mantle from our good old friend

### **40 The Amazing Tomatoboy!**

A Bangalore kid makes games “for his friends,” but we liked his tomato-centric game too! Meet this bite-sized creator of good, clean fun

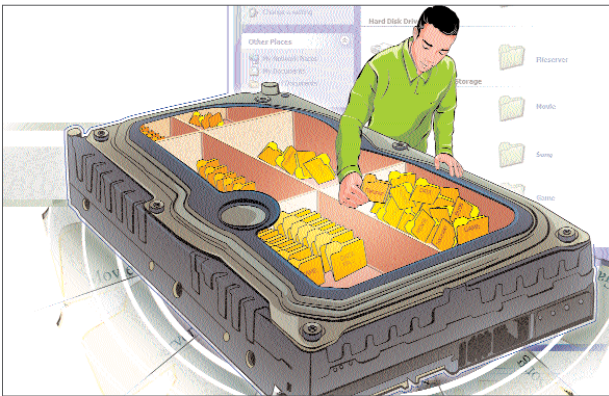
### **42 Sounds Good!**

Which MP3 player will you buy? We've tested 49 so you can narrow down your choice to exactly what you want



# Contents Magazine

## Digital Tools



### **67 Dude, Where's My Data?** 📁

Wallowing in a mess of files? Pull up your socks and organise that hard drive!

### **72 Know More About**

Winamp, our favourite music player... well...plays music, but did you know how much it lets you tweak the way it sounds?

### **75 Net Gain**

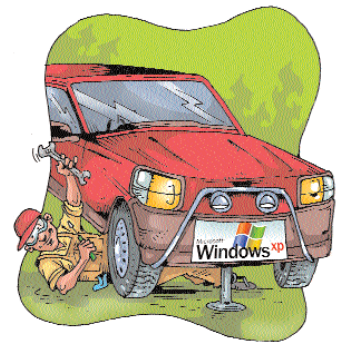
Share your favourites with the world, and meet a few like-minded people while you're at it. Mmmm...del.icio.us!

### **76 New & Notable**

Insanely indulgent cameras, handy USB drives and other miscellaneous gadgets landed themselves in our offices this month

### **81 Tips & Tricks** 🛠️

Create your own game, protect your USB drive, and stalk people on Yahoo! Messenger!



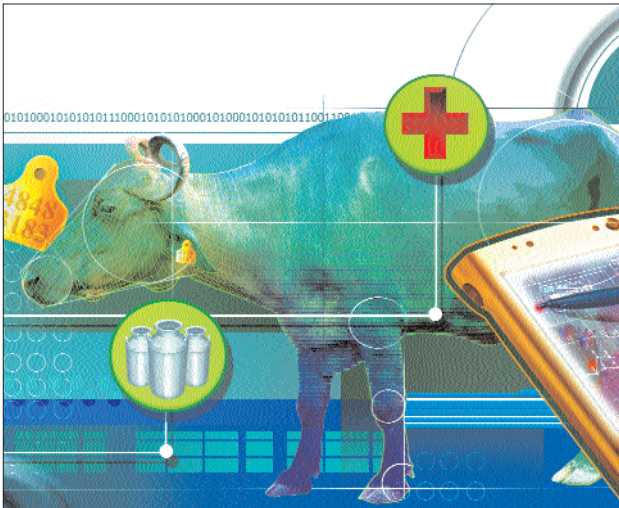
### **94 Agent 001**

SATA? PATA? Whata? Agent 001 finds you the best hard drives

## Digital Business

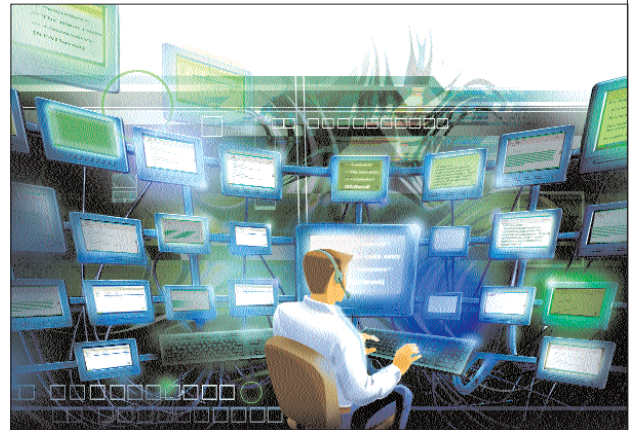
### 97 Milking For Tomorrow ☑

With the wonderful blessing that is RFID, the country's milk production moo-ves to new levels. Dr Samad of the Bombay Veterinary College has developed a scientific approach to milk production that could herald a new era in cow and buffalo management



### 100 Talk is Cheap

Save your business some wallet-destroying calls—make all your important international calls for peanuts using VoIP!

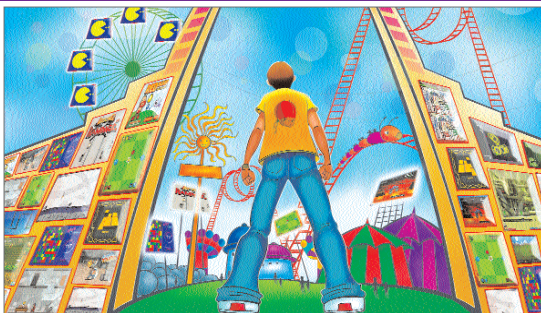


### 103 Bug Hunters ☑

Software doesn't hit you right off the production line—how do you become the person that approves it before it's unleashed upon the masses?

# May 2006

## Digital Leisure



### 111 www.timepass.com ☑

One PC + one browser + one Internet connection = one truckload of fun

### 116 Spreading The Word

Gujjus of the world, unite! Gujaratilexicon.com helps young 'uns—and older 'uns—stay in touch with their mother tongue



### 118 Amped! ☑

45 glorious excuses to turn up the volume!

### 134 Game On

Onimusha 3: Demon Siege, The Godfather, and The Lord of the Rings—the Battle for Middle Earth reviewed

## Escape



### 139

Edsger Dijkstra—programmers thank him every day, even if they can't pronounce his name

### 138

What do conductors mean with all that baton-waving? Here's some cutting-edge research!

## REGULARS

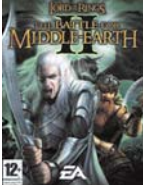
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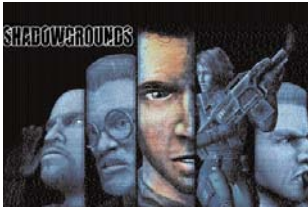
DIGITAL PASSION

GAME

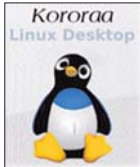
**The Lord Of The Rings: The Battle For Middle Earth 2**  
Experience Middle-earth like never before in The Lord of the Rings, The Battle for Middle-earth II. The game that puts you in command of a real-time, open world. Control the legendary heroes, massive armies, and epic campaigns of Middle-earth in over 25 missions based on all three films of The Lord of the Rings trilogy



**Tomb Raider: Legend Demo**  
Tomb Raider: Legend revives the athletic, intelligent and entertaining adventurer who won the hearts and minds of gamers worldwide. Lara comes alive with intricately animated expressions, moves and abilities



**Shadowgrounds Demo**  
Shadowgrounds brings fresh air to the action genre with its unique perspective, explosive action sequences, innovative weapon upgrade system and a well-developed story



LINUX

- Kororaa Xgl Live CD 0.2
- ImageMagick 6.2.6-7
- LabPlot 1.5.0
- RealPlayer 10.0.5 GOLD
- ThinStation 2.1.2

DEV TOOLS

- Code::Blocks 1rc2
- Free Pascal 2.2
- Open Watcom C/C++ 1.4
- FlexTracer 2.3 Beta
- MySQL Turbo Manager Enterprise Edition 3.5.1.5
- Tama ExpertInstall 3.0.2261
- TracePlus Win32 4.30.000
- VB.Net to C# Converter 1.51.005.3
- Xstic Active SourceCode 2.0.44

DIGITAL TOOLS

Adobe Photoshop CS2

Adobe Photoshop CS2 software, the professional image-editing standard and leader of the Photoshop digital imaging line, delivers more of what you crave. Groundbreaking creative tools help you achieve extraordinary results



MP3 Maker 10 deluxe

MP3 is the top format for music on the move. MAGIX mp3 maker 10 deluxe creates MP3s and a host of other music formats for playback on nearly any device



**Ambrosoft FantaMorph Pro 3.6**  
You can do everything a professional animator

director does to create amazing images and animations. FantaMorph supports most image formats including BMP, JPEG, TIFF, PNG, GIF, TGA, PCX, and even professional 32bit with alpha formats

MULTIMEDIA

SongBird

Songbird is a Web player built from Firefox's browser engine. Songbird is open source, will run on Windows, Mac OS X and Linux and supports user contributed, cross-platform extensions



- Audio Sliders 4.2
- AVI2Flash Converter 1.1c
- Speed DVD Creator 4.0.11.15
- Speed Video Splitter 2.4.11.17

INTERNET

- Deskcam 7.3.15
- RealTunnel 1.0.1-0250
- Utopia Chat System 8.1
- Webripper 1.1
- AV Voice Changer Software Diamond Edition 4.0.59
- Bandwidth Monitor 2.9.0.623
- BlackICE Evaluation
- BlackWidow 5.2

SYSTEM

- Norton AntiVirus Virus Definitions April 7, 2006
- NVIDIA Graphics Driver - GeForce and TNT 2
- Office XP Service Pack 3 (SP3)
- Vista Customization Pack 3.1
- Backup-2006 Studio 5.1.2.204
- CD/DVD Data Recovery 1.0.699
- CD-Quick Cache 3.21
- Drive Encryption 3.155



DIGITAL BUSINESS

FACT Accounting for Windows Version 22

Starting from the most basic of the facilities, which cater to your fundamental accounting requirements, to the advanced features, which answer your complex accounting needs

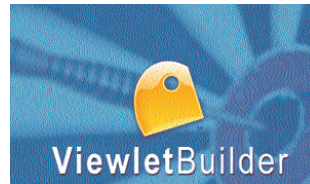


Microsoft Money 2006



Deluxe Trial 15

Help simplify your finances as you say on top of credit and debt. You control all of your accounts in one place with a single password. Get all the features, power, and convenience of the Money 2006 Deluxe full product. 90-day trial version



ViewletBuilder4 4.5.3

ViewletBuilder's content creation process has revolutionized the way in which software is presented and demonstrated. ViewletBuilder's patented content creation mechanism allows users to take a series of editable screen captures that are then animated to produce a flawless Flash simulation

PRODUCTIVITY TOOLS

- Synthis Process Modeler 3.6.6
- Timesheet Xpress Free 8.0 build 0370
- DiaryOne 6
- KnowledgeWorkshop 1.7.1



MOBILE APPS

- AudioGizmo Ringtone Creator 2
- Enslave 1.0



DIGITAL LEISURE

SMALL GAMES



This epic tale of mahjong tile matching has hundreds of layouts, three styles of play, and an engaging



The World's Best Loved Word Game Scrabble is now the ultimate interactive word game!

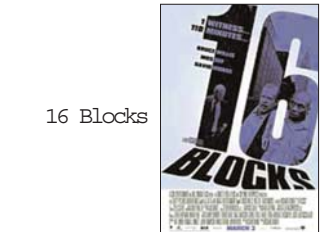


Sky Bubbles is an action-puzzle game in which you wage war against an evil sorcerer to save the inhabitants of an enchanted

E-BOOKS

The Time Machine

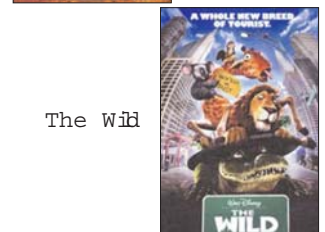
- How to Speak and Write Correctly
- Relativity: the Special and General Theory
- The Practice and Science of Drawing



16 Blocks



Bandidas



The Wild

WALLPAPERS

- Art
- Celebs
- Earth
- Nature
- Space

## DIGITAL PASSION

Game Maker 6.1



Have you ever wanted to be able to design computer games, but didn't want to spend countless hours learning how to become a programmer? If Yes, then this is the software for you



JCreator LE 3.5

JCreator LE is a light-weight development environment for Java technologies. Features include project management, templates, customisable syntax highlighting, class views, tabbed documents, multiple compilers, wizards, and a fully customisable interface



MX Kollection 3

MX Kollection 3 is a bundle of our most popular MX extensions that will change the way you build dynamic web sites with Dreamweaver

## DEVELOPER TOOLS

- n Abyss Web Server XI 2.3.0.5
- n ASP.NET Web Matrix 0.6
- n BlueT 2.1.2
- n ConTEXT 0.98.3
- n jEdit 4.2



- n orangePixelMeter 2006 2.04
- n Pelles C 4.0.5
- n PHP DESIGNER 2006 Beta
- n PSPad Editor 4.5
- n SharpDevelop 1.1
- n Project Analyzer 8.0.04

## LINUX

- n Dvd::rip 0.52.7
- n Exim 4.61
- n GkrellM 2.2.9
- n PythonCAD R30
- n Tellico 1.1.4
- n Zope 2.9.2
- n LiteSpeed Web Server V2.1.14 Standard Edition
- n Paragon NTFS for Linux 2.0
- n Alsa driver 1.0.11rc4
- n DataparkSearch 4.38



## DIGITAL TOOLS

Corel Photo Album 6



Ulead PhotoImpact 11



## MULTIMEDIA

- n 3DPlus 2
- n Mp3tag 2.35
- n Nero CD-DVD Speed 4.50
- n Nero InfoTool 4.03
- n PgcEdit 0.6.4 beta 9
- n vanBasco's Karaoke Player
- n VirtualDub v1.6.14
- n InterVideo Home Theater 2 Platinum

## INTERNET

- n Acoo Browser 1.36 build 648
- n Chat Controller 1.2
- n DC++ Acceleration Patch 3.6
- n Download Accelerator Plus 8
- n GOIM 1.0.3
- n GroupLoad 2
- n Magitime 6
- n Mozilla Firefox 2 alpha 1
- n MySpeed Personal Edition 1.2a build 87
- n Omnik 1.1.0.6
- n Peer2Mail 1.6 build #11
- n RssReader 1.0.88
- n SababaDC 0.674
- n Star Downloader Free 1.45

## SYSTEM

- n Adobe Reader SpeedUp
- n Auto Shutdown Timer
- n AutoHotkey 1.0.42.06
- n Core FTP LE 1.3c.1447.4
- n DiskDeleter ZW 1.0.1
- n File Backup Watcher 2.7.6R1
- n FreeRAM XP Pro 1.52
- n Psum 2.51
- n J2SE Runtime Environment 5.0 Update 6
- n Keyfinder Thing 2.5.4
- n PC-Com Basic 7.34
- n Vita Inspirat
- n Wake On LAN Ex
- n Wild Time Explorer 1.8
- n Xplorer2 lite 1.5.0.1
- n Beyond Compare 2.4 build 240
- n FolderSizes 3.6.0.1
- n Privacy Shield 3.0.24
- n SmartSync Pro 2.11.0.895

## ESSENTIALS

- n .NET Framework 1.1
- n Adobe Reader 7.0.7
- n Avast Home Edition 4.6
- n Digit Software Archive 2006 Beta
- n Trifan View 3.98
- n KLM Codec Pack 1.52
- n Opera 8.53
- n Spybot Search & Destroy 1.4
- n VLC Media Player 0.8.4



## DIGITAL BUSINESS

PDFfill PDF Tools 4.1



PDFfill PDF Tools is free PDF toolbox to merge, split, reorder, encrypt or decrypt, rotate, crop, reformat, header or footer, watermark, images to PDF, PDF to images, form fields delete, flatten, and list, and PostScript to PDF



ClinicGate Basic 2.0.0.6

ClinicGate is user friendly software for physicians that integrates Appointment Scheduling, Patients files, and generates 25 customized reports. It contains all the clinical and operational elements for a successful running practice

## PRODUCTIVITY TOOLS

- n AB Invoicing 4.3.1.31
- n ActionXP 5.2
- n Chaos Manager 2.23
- n Droster 2.2.1
- n GFP - Personal Finance Manager 0.5.8
- n TiddlyWiki
- n ZD Soft Screen Recorder 1.4.3
- n Atlantis Word Processor 1.6.1.1
- n SpamFighter Exchange Server Module 3
- n WorkTime 3.17

## MOBILE APPS

- n Mig33 2



- n MobileLeap Today 1
- n ScanR Whiteboards for Treo 700w 2.1
- n MobiSystems OfficeSuite (N90) 2.1
- n Photocast Viewer 0.8
- n Sompoy Media Player 1
- n XnView Pocket 1.35
- n Essentials QVGA + VGA 3D Icons 1.3
- n Reversi Mobile for Windows 1.0
- n Convert to Reader 1
- n Wizard 1.2
- n ak 1.2

## DIGITAL LEISURE

### SMALL GAMES

Cake Mania



Help Jill show big business who's boss in this fast-paced puzzle game! When the retail behemoth "Mega-Mart" moves in, Jill's beloved family bakery is forced to shut down. But she's determined to get the business back on its feet



Feeding Frenzy 2

Dodge predators and eat your way up the food chain in two exciting game modes! With unique underwater environments, frisky new fish, 60 levels and upgraded graphics, the feeding is more

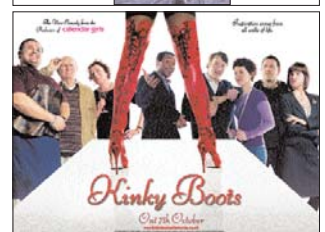


frenzied than ever before

Mah Jong Medley

Mah Jong Medley has 4 game modes to choose from. Classic mode allows you to play like you've always played Mah Jong Solitaire. Select two tiles that add up to ten in Ten mode. Move up to two tiles out of the way in Free Cell

### VIDEOS



Online

**By Demand**

You get to choose what goes in *Digit* Interactive. This month, you chose: **The Lord of the Rings Corel Photo Album**



**Digit Patrons**

It really does pay to be loyal! Find out more on [www.thinkdigit.com](http://www.thinkdigit.com)

**Digit Reader Poll**

**This Month's Question**

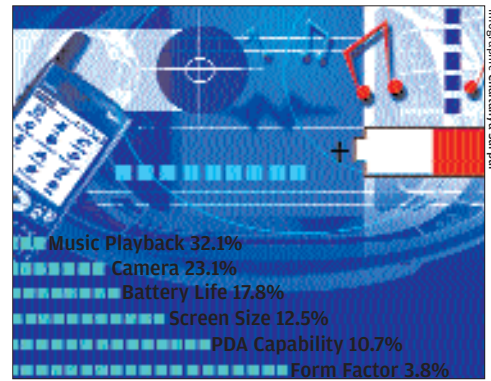
**How much of a gamer are you?**

- Computer games aren't for me
- I game 1 - 10 hours a week
- More like 10 - 20 hours a week
- More than 20 hours a week
- Hey, I don't count! I'm gaming all the time!

Log on to [www.thinkdigit.com](http://www.thinkdigit.com) and vote!

**Last Month's Question:**

**What do you most look for in a cell phone?**



Total votes **4,087**

taste technology at [www.thinkdigit.com](http://www.thinkdigit.com)

**There's something for everyone on the Digit Forum** [www.thinkdigit.com/forum](http://www.thinkdigit.com/forum)

The time now is Fri Mar 24, 2006 11:18 am

View unanswered posts

Share your views with the Digit Community, exchange tips and tricks, look for previous Digit issues, etc.

Forum	Topics	Posts	Last Post
<b>Feedback</b>			
<b>IMPORTANT: Forum Rules</b> All members are REQUIRED to read the rules mentioned in here before registering or posting!	1	2	Mon Feb 28, 2005 2:00 pm Raaabo
<b>Digitized</b> Interact with Team Digit members. Tell us what you think about the magazine (articles / sections), DVD contents and Web site. What you liked, what you didn't, and what you expect to see in the future... Moderators: Moderators, Administrators	51	4653	Fri Mar 24, 2006 9:42 am vignesh
<b>News</b>			
<b>Latest News</b> This forum is for members to share the latest technology news with others. Make sure to post the SOURCE at the beginning of every post. Moderators: Moderators, MemberMods, Administrators, Trusted Members	393	2708	Fri Mar 24, 2006 10:56 am QwertyManiac
<b>In General...</b> Anything that doesn't fit into the other sections—from upcoming technology to personal anecdotes—should be posted here Moderators: Moderators, MemberMods, Administrators, Trusted Members	2252	36695	Fri Mar 24, 2006 11:12 am gary4qar
<b>Across The Board</b>			
<b>Open Source</b> A place where you can talk to like-minded people about the fastest growing software movement today! Moderators: Moderators, MemberMods, Administrators	1314	10403	Fri Mar 24, 2006 11:15 am Ramakrishnan
<b>QnA</b> This is the place to share what you know, and learn what you don't. If you have questions that do not qualify as either Hardware or Software questions, post them here...	11022	73153	Fri Mar 24, 2006 11:07 am charanqk



### Blu-Ray Discs Being Shipped

TDK has started shipping cartridge-free Blu-ray discs, in both recordable and re-writable formats. Both versions are available in single-layer 25 GB and dual-layer 50 GB capacities. Costs range from \$20 to \$60 (Rs 960–2,880).



### 7900 On Your Laptop

NVIDIA stokes the fire for mobile gaming with the GeForce Go 7900 GTX and 7900 GS Mobile GPUs, which have already started shipping with Dell and Toshiba's gaming notebooks. These companies are the only ones shipping the GPUs now, but many will follow.



# Enter

**Sonali Kulkarni**  
Actress

**A** talented actress, Sonali Kulkarni has been a central figure in the theatre, having acted in plays such as *Sir, Sir, Sarla*, besides several films such as *Mission Kashmir* and *Dil Chahta Hai*. Here's a peek into the geek in her.

#### How would you define technology?

Technology is purely advancement. Every innovation in technology is a step mankind is taking towards development. It also acts as a stimulator—technological progress creates a qualitative difference in our lives.

#### What is tech to you?

With today's pace of life, even familiar technological gadgets like the TV or radio ease our stress. Technology is sometimes a double-edged sword. There's a desire to create the new, but at the same time, the "already there" becomes outdated.

#### Which of your gadgets are your favourites?

I just cannot make do without my cell phone—a Nokia 6600, and my Sony laptop. I have a host of other gadgets, like my DVD player, which I depend on without recognising their need.

#### Have you ever used technology for a specific purpose?

I've recently launched a Web site, and the forum here is open for people to discuss topics that interest them. I intend to use this space to do what I can with the renown that I receive through my profession.

### SOURCE OF WOES

## No 3D For Linux, Says FSF

**T**he Free Software Foundation, the organisation that drafted the GPL (General Public License) that all open source software distributors need to follow, states that open source software cannot contain proprietary or closed source drivers. All well and good.

However, with the shift towards 3D Linux operating systems, which is intended mainly to combat Windows Vista's 3D interface, this directive of the GPL is becoming a pain in the neck, as it were.

Loads of open source flag bearers have criticised the inclusion and integration of various 3D Linux distros with drivers from NVIDIA and ATI. But considering that both ATI and NVIDIA refuse to provide open source drivers—which, by the way, is completely fine, because neither is an open source software company, and also that between the two of them, they hold all the market share worth mentioning in the 3D graphics hardware market—problems abound in 3D-Linux world.

"If Linux expects broader vendor support, the community needs to capitulate to proprietary software involvement," said Raven Zachary, an analyst at The 451 Group.

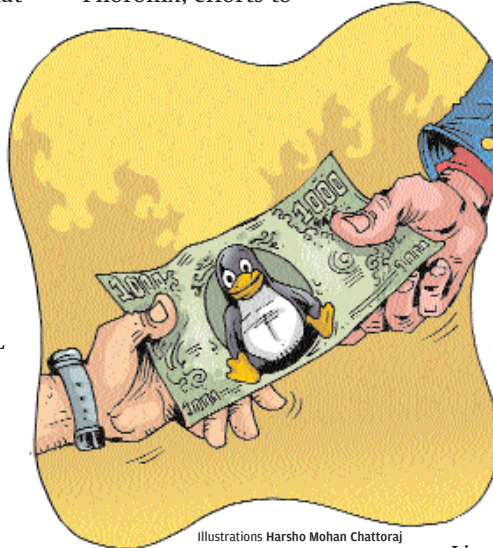
Writing open source graphics drivers without help from NVIDIA and ATI is tough. According to Michael Larabel, founder of high-end Linux hardware site Phoronix, efforts to

secondary issue. "It's so hard to write a graphics driver that open-sourcing it would not help," said Andrew Fear, NVIDIA's software product

manager. Some of NVIDIA's components are open, though, including some driver configuration tools and a driver component that interfaces to the kernel. "We believe in open source where it makes sense," Fear added.

Linux founder Linus Torvalds has argued that some proprietary modules are OK because they're not derived from the

Linux kernel, but were originally designed to work with other OSes. If they had originated from the kernel, that would require them to be covered by the GPL. The FSF doesn't quite agree. "If



Illustrations Harsho Mohan Chatteraj

reverse-engineer open source equivalents often are months behind and produce only "rudimentary" drivers. For NVIDIA, intellectual property is a





## Security Watch

### Multiple Internet Explorer Vulnerabilities

#### The Problem

In April, multiple vulnerabilities were reported in Internet Explorer. These can be exploited by the evil folks to conduct "cross-site scripting attacks," phishing attacks, or compromise your system.

For example, a certain error can be exploited to corrupt memory in a way that may allow execution of arbitrary code on your computer. Then, a certain unspecified error can be exploited to spoof information displayed in the address bar. In fact, according to Secunia.com, there are *ten* vulnerabilities!

Microsoft has released patches for IE 5 and 6, and has rated them as "critical." While Windows users with the Automatic Update function enabled will have the fixes delivered to them automatically, Microsoft recommends that customers without Automatic Update turned on should "immediately" go to their Web site and download the fixes.

#### The Solution

You need to patch Internet Explorer immediately. Head to [www.microsoft.com/windows/ie/downloads/critical/default.mspx](http://www.microsoft.com/windows/ie/downloads/critical/default.mspx) for details and for the download link. The most critical sub-patch in this mega-patch is the one that fixes the recently-disclosed DHTML Method Call Memory Corruption Vulnerability, which affects all recent versions of Windows—including, of course, 98 and XP.

the kernel were pure GPL in its licence terms... you couldn't link proprietary video drivers into it, whether dynamically or statically," FSF attorney Eben Moglen said in a January interview.

Here's a scenario where open source supporters are clearly shooting themselves in the foot!

#### MY IDEA, YOUR PATENT

## Patent Those Light Bulb Moments... Or Else

Here's one of the few non-success stories that make it to the news. Geoff Goodfellow could have been \$600 million (Rs 2,700 crore) richer, it turns out, after a company called NTP got that amount for having invented something—which Goodfellow had done several years earlier.

Back in 1982, Geoff came up with a revolutionary idea: sending messages to portable devices using wireless technology! "What's so great about that?", all of us with GPRS, cell phones and PDAs will ask. We draw your attention to the date—1982!

Although he did get financial help for a venture in the early '90s from some companies such as Motorola, his venture flopped. This is no surprise, because back then all we

had were alphanumeric pagers, and most of the portable devices we take for granted today hadn't even been invented!

So Goodfellow did what any jaded silicon valley professional would do: went to Prague, bought a bar and gave up on his idea of wireless e-mail.

Of course, while he was there, serving liquor to cheery patrons, a new device called the BlackBerry was released, which, as we all know now, offers a wireless e-mail feature. Goodfellow thought the world had forgotten that it was his idea in the first place, but didn't count on the thoroughness of a lawyer defending a patent claim in a multi-million dollar lawsuit!

Turns out James H Wallace Jr, the lawyer in question, was defending a company called NTP's patent rights to, yes, you guessed it, "wireless e-mail." That's when thorough research led him to discover that it was actually Goodfellow who invented wireless e-mail.

### HOT Portable Video



MP3 players—hard disk or Flash—with colour widescreens capable of playing movies, displaying digicam images, and playing songs in various formats are in! You can get these for just a few thousand more than plain MP3 players.

### Plain Audio

NOT



Ordinary MP3 players with a three or four-colour display, or worse, a greyscale display. Or, MP3 players that have support for just voice recording, with a capacity of 256 MB to 512 MB. Spend a few grand more and get yourself a video-capable player!

Goodfellow happens to be one of the small group of people who, like open source proponents, does not believe in patenting ideas or software.

Almost a decade after Goodfellow envisaged the wireless e-mail concept, Thomas J. Campana Jr., who later went on to be one of the founders of NTP, patented wireless e-mail.



Geoff Goodfellow—Picture Courtesy NYTimes.com

## One Silly Question

### "What would you do if Google went down?"



"It would be the end of my PG project!"  
Ankit, Lucknow



"I will sell my laptop!!"  
Tanmay Bhargava, Delhi



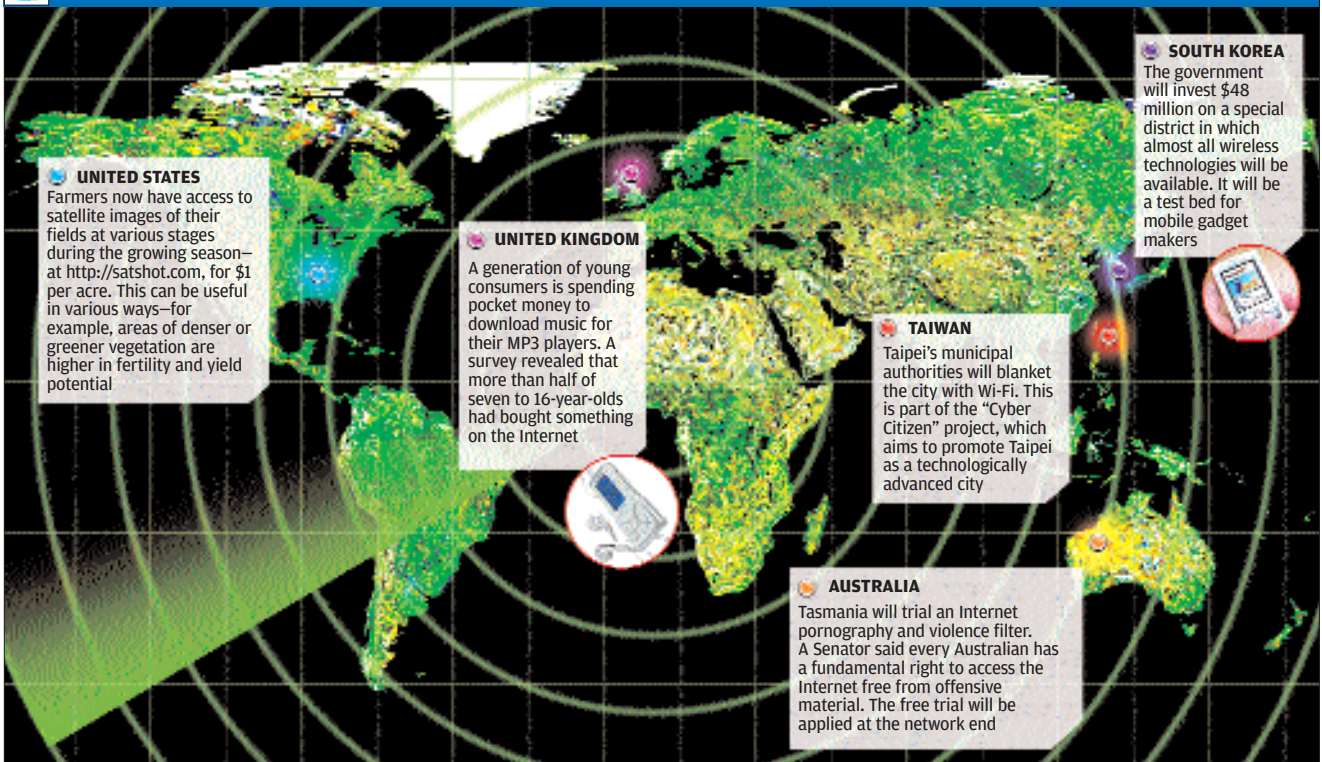
"I shall finally sleep"  
Vishal Nagota, Jaipur



"I will buy Google and rebuild it!!"  
Prashant Tiwari, Shikowabad



"I will build a company like Google"  
Alok Jha, Ranchi



**UNITED STATES**  
Farmers now have access to satellite images of their fields at various stages during the growing season—at <http://satshot.com>, for \$1 per acre. This can be useful in various ways—for example, areas of denser or greener vegetation are higher in fertility and yield potential

**UNITED KINGDOM**  
A generation of young consumers is spending pocket money to download music for their MP3 players. A survey revealed that more than half of seven to 16-year-olds had bought something on the Internet

**SOUTH KOREA**  
The government will invest \$48 million on a special district in which almost all wireless technologies will be available. It will be a test bed for mobile gadget makers

**TAIWAN**  
Taipei's municipal authorities will blanket the city with Wi-Fi. This is part of the "Cyber Citizen" project, which aims to promote Taipei as a technologically advanced city

**AUSTRALIA**  
Tasmania will trial an Internet pornography and violence filter. A Senator said every Australian has a fundamental right to access the Internet free from offensive material. The free trial will be applied at the network end

This led to the lawsuit that NTP filed against Research in Motion (RiM), the company that makes the BlackBerry. The lawsuit was recently settled out of court, with RiM paying NTP over \$600 million to get licensing to use "wireless e-mail" technology in their devices.

A *New York Times* article recently quoted Goodfellow as saying: "You don't patent the obvious. The way you compete is to build something that is faster, better, cheaper. You don't lock your ideas up in a patent and rest on your laurels."

All credit to the man for having no regrets. He's now 50, back in the US, and back in the business, helping his brother run an Internet company, chairing a company researching VoIP technologies, and focusing on the "intersection of technology and entertainment."

There's a lesson in here for budding technology entrepreneurs: you don't become rich by being a Good Fellow!

ANOTHER FIRST FOR SAMSUNG

## Stacked Chips Design To Make Devices Smaller

Samsung has developed a chip stacking design that will allow chips used in mobile phones and portable music players to be stacked one on top of each other, and connected using wires and smaller circuit boards, rather than lying side by side on a large circuit board.

Though this idea may seem only logical and not really impressive, the fact is that Samsung is the first company to do this successfully. Plans state 2007 as the targeted date for shipping the stacked chip package.

The "package" is actually a multi-chip module that consists of multiple chips, each in their own enclosure, which

## Three Incredibly Useful Sites

Books, Pets, Graphics

[www.gutenberg.org/catalog/](http://www.gutenberg.org/catalog/)



**Project Gutenberg**

This is a priceless collection of free out-of-print or non-copyrighted books! You can search the database by author name, title, or words in the full text of the book. Books are available in HTML, plaintext, and other formats. There are several other categories: audio books, recorded music, moving pictures, and still pictures.

[www.petplace.com](http://www.petplace.com)



**PetPlace.com**

If you've got a pet, PetPlace is the place to go for info, help and more. The site claims over 5,000 vet-approved articles. It helps you deal with common problems such as ear infections in cats and dogs. There's also stuff about proper feeding, grooming, exercise, and even ways to bond with your pet! Did you know you shouldn't feed your dog chocolate? Find out why at PetPlace.com!

[www.3dcafe.com](http://www.3dcafe.com)



**3D Cafe**

If this month's *Fast Track* has inspired you to do some graphics and photo editing on your own, this is the portal you need to visit. "Free Stuff" leads you to tons of free 3D models, fonts, plugins and software, texture maps, Web tools and more. "Tutorials" lends you tutorials for 3D Studio Max, Animation Master, AutoCAD... the list goes on!



Photograph Thamizhelango Natarajan

Each month, *Digit* will carry a caption for a photo. Come up with something funnier, and beat the *Digit* team at their own game! Entries accepted by the 15<sup>th</sup> of this month.

# Beat That!

**Digit Caption**  
 “Tech Armour”

**Last Month's Winner!**

Anurag,  
 Near Shakti Kunj, Yadav Nagar,  
 Muzaffarpur - 842001  
 “MS Office XPee”



E-mail your caption with the subject 'Beat That', and your postal address, to [beatthat@thinkdigit.com](mailto:beatthat@thinkdigit.com) and win **Leadership the Challenge** by Kouzes and Posner Published by **WILEY-INDIA**



has metal studs outside the casing to which wires are connected. The technology being used here is TSV (Through-Silicon Vias), which was developed by Tru-Si, a company in the US that Intel holds stake in. This technology was developed to try and do away with the bandwidth restrictions imposed on chips because of motherboards and the distances that data has to travel across them, from one chip to another.

TSV will help make motherboards and circuit boards smaller, as well as reduce overall dimensions of everything from PCs to mobile phones. Add to this the enhanced bandwidth available for communication with various chips, and you have a promising solution. Well, Samsung, for one, seems to be sure that it's the way to go. Of course it's not like you'll even know when it hits the markets, because all this is on the micro scale and inside your phone casing. Get ready for smaller and more powerful

Samsung phones, though actually, we'd rather people solved the display problems in mobile devices!

**A PATENT ISSUE AGAIN**

## Apple's Software Bubble Burst

**B**urst.com, a patent holder for a technology that speeds up streaming of audio and video content over the Internet, is suing Apple over its iTunes software and streaming QuickTime and iPod software.

Burst claims that it holds the patent for sending streaming audio and video over the Internet faster than real-time: when you receive signal reception on a TV it's in real-time, but when you stream, say, 30 minutes of video or audio from a server in anything less than 30 minutes, you're infringing on Burst's patent!

Ridiculous as this may sound, this is not the first

time Burst has humbled a large corporation into accepting their patent rights. Just last year, Burst reached an out-of-court settlement with Microsoft (Burst had sued them as well), and Microsoft coughed up \$60 million (Rs 270 crore) to get licensing from Burst for their patented method of accelerated streaming of audio and video.

Apple, however, is not about to part with their money that easily, and claims that Burst does not have valid claims to the patents. Sometime in 2004, Burst approached Apple to demand that Apple buy licensing for their usage of the technology that Burst has patents for. However, the talks broke down after Apple claimed that "Burst.com's attorneys threatened litigation against Apple." What followed was a "declaratory relief complaint" by Apple against Burst's claims to the patents in question.

Apple has decided to leave the ruling to the courts, but things do not

look good for the iPod creators. According to the countersuit filed by Burst, three of the four patents that Apple is calling "invalid" are the same patents that Burst used to sue Microsoft. Since a previous company (Microsoft, at that) has already accepted these patents after a lawsuit, and has bought licensing from Burst, we honestly don't think Apple has a chance!

**SENDER ID**

## MS Pushes E-Mail Verification Software

**I**n a renewed attempt to push for adoption of its Sender ID verification software, Microsoft will soon announce the results of its tests with the software on their own Hotmail service.

Microsoft has always been one of the most avid

## GENDER

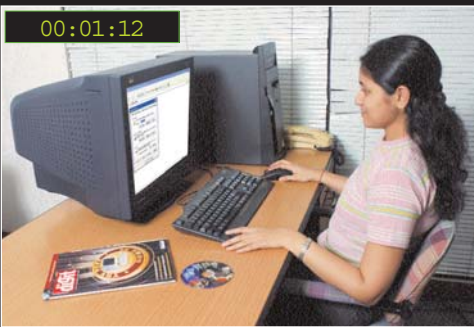
Bela Mehta vs. Prashant Dabholkar



## BENDERS

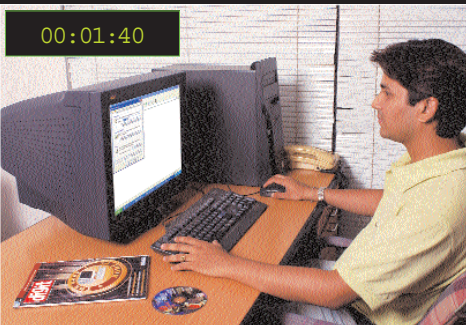
## Make IE always load pages from cache

00:01:12



We figured Bela knew something about how to go about the task, seeing as she was so keen to take it up: she was at it before we could say "Achtung"! Clicking open IE, she went to Tools, opened Internet Options and was at Settings. She did pause here for a while and wondered what to click on. After some tense pondering, she clicked "Every time you start IE". But when she opened IE and browsed a little, she found the setting wasn't working. Bela then retracted her choice and clicked on "Never".

00:01:40



Prashant said he could do the task in two ways. He first right-clicked on the IE icon on the Quick Launch bar, and went to Properties > Shortcut. He immediately realised he'd done something wrong, but he misguidedly went on to clear the IE History. We explained the task again to a confused Prashant, and he seemed to know that the path was only through Internet Options—he was there in a jiffy. Once in Settings, he knew that clicking on Never was what needed doing.

supporters of e-mail verification, and has been accused of aggressively pushing its Sender ID product aggressively. Whether Microsoft has vested interests or not, the fact is that the world has lost faith in e-mail, and ~some~ software or authentication system is a must if we are to ever take e-mail seriously again!

Most of us worry about e-mail filters falsely identifying genuine e-mail as spam, especially since we're used to just deleting everything in our junk mail folders. Since most of us would rather let some spam through every day, than even lose one genuine e-mail by software that classifies it as spam, Microsoft has worked hard

on reducing the number of *false positives*—good e-mail identified as spam—and claims that with the enhanced anti-spam filter and Sender ID working together, they have been able to bring the false positives down to anywhere between 80 per cent and zero! It also claims that the amount of spam e-mail that's let through to the average inbox on a server running Sender ID is reduced by 85 per cent.

In the long run, Microsoft claims it will be able to eradicate phishing and e-mail spoofing, because Sender ID works by verifying that the server who sent the e-mail actually resolves as the domain it was sent from. Microsoft also wants to set up a rating system to identify domains or servers as spammers or clean mail senders, by using Sender ID and spam filters to distinguish between which servers or domains send out spam and which don't.

Another technology that promises to do away with spam and phishing is DomainKeys Identified Mail (DKIM), a cross between Yahoo!'s DomainKeys software and Cisco's Internet Identified Mail software. DKIM works by attaching a digital signature to e-mail that is encrypted using a public key encryption method so that recipients (or their e-mail software, more appropriately) can verify that the mail was indeed sent from the claimed sender.

The problem is that so many companies have been working on solutions that

we now have an embarrassment of choices, and none of them are 100 per cent fool-proof. What we really need is for all these big companies to get together and fight the spammer as one organisation instead of squabbling over whose technology is better.

WATCH THE ADS—OR ELSE!

## Philips' Patent Resurrected

You've probably wondered at some point or the other: "What's the point of pop-up ads when everyone has a pop-up blocker?" The answer to that question is that *not* everyone has a pop-up blocker: yes, there still are people who use browsers that don't have them, or, such folks don't enable the blocker (unless it's enabled by default). Then there are Flash ads, and people are installing plugins such as Flashblock for Firefox. What will happen to online advertising when everyone installs a blocker for everything?

You get all this free stuff on the Net without paying a penny—isn't it fair that the ads get watched?

Now, take this to the context of TV, and it's even worse: people just change the channel when the ads begin. And you don't even have to be tech-savvy in the least to do that! So Philips is planning to patent a technique that will prevent viewers from skipping

## High-Definition (HD)

HD, meaning four times current DVD quality, is all over the news: "Toshiba will begin selling laptops with HD DVD-ROM drives in Japan in mid-May." Then there's "HD Radio to See Broader Availability," in the wake of "RadioShack to Offer HD Radios." And then, "Sky's upcoming PVR will be able to record 30 hours of Hi-Def telly, courtesy a 160 GB hard drive." Then take this: "Ateme Launches MPEG-4 AVC/H.264 Real-Time

HD Hardware Encoder." And this: "Sanyo launches two new HD Ready LCDs. The 27-inch and 32-inch LD6 models succeed the existing LD4 range..." Cameras aren't spared, either: "Canon Introduces HDgc High Definition Lenses to Support the Expanding HD Camera Market." DVD formats, radio, PVRs, hardware encoders, LCD screens, cameras... yes, it's an HD-mad, mad, mad world! Though India isn't shining on it yet!

**Buzzword**  
of the MONTH



### Rootkit

#### What is a rootkit?

The evil rootkit is a set of software tools usually used by an intruder after gaining access to a computer. The tools are intended to conceal running processes, files or system data, which helps the intruder maintain access to the system without the user's knowledge.

#### How does it work?

A rootkit integrates itself deep within the OS, taking over bits and pieces of the code, and then hiding from anything that is trying to detect it. Consider a regular OS file. The rootkit might infect the file and become part of it. If you try and use an anti-virus or anti-spyware against it, the rootkit performs a trick that in effect tells the anti- software that there's nothing wrong with the file. Thus, the rootkit is completely invisible.

#### Who developed it?

"Rootkit" originally referred to a set of recompiled Unix tools that would hide any trace of an intruder; the tools would normally display such traces. This allowed the intruder to be a "root" on the system without being visible to the administrator. The term is now not restricted to Unix-based OSes; such tools exist for OSes such as Windows.

#### Where is it used?

Usually on compromised computers, and famously, on Sony music CDs until recently.

#### When did the term become popular?

In October 2005, a certain blog detailed a description of the characteristics of the software on Sony BMG music CDs. The article said the software was illegitimate. It was stated that there were shortcomings in the software design that manifest themselves as security holes, which can be exploited by malicious software.

#### Why are rootkits legitimately needed?

Rootkits allow the programmer to see and access usernames and login information for sites that require them.

through ads embedded within recorded programmes, and, yes, even channel-surfing during ad breaks. Viewers will be forced to pay if they want to avoid the ads.

"A viewer may either watch the ads or pay a fee in order to be able to change channels or fast-forward when the ads are being displayed," states Philips' would-be patent.

Philips' application for the patent was originally filed in 2003, but was only recently made available online. It outlines how digital flags would be transmitted with the ads—a TV, PVR, DVD recorder or other receiver would detect the flag and ensure the ads are shown no matter what. The exact details of how this works aren't clear.

Why has a 2003 patent not made it to market yet? Philips admits the idea might be "greatly resented by the viewers," and suggests that broadcasters and device makers present warnings when the flag is detected and used. They acknowledge that the "manufacturer of a video display device (such as a set top box) has no way to ensure that a program broadcaster will notify the viewers and explain why the viewers are no longer able to switch channels during advertisements." Yes, it's a difficult proposition indeed.

However, "resented" as it may be by viewers—that includes you—we think something like this is bound to make it way to market some time or the other, whether we're talking about the Web or television. For example, ad-free HBO in the US costs a pretty penny each month, while in India, it's virtually ad-free because we simply switch channels—and we pay a pittance for the channel. How long can such a situation last? And on the Web, it's much easier to force you to watch ads—there isn't even a new technology required! How

long before all sites require you to watch ads before content is displayed?

There has been a trend on the Net of forcing people to watch ads. Some years ago, there were hardly any sites that required you to register in order to view their content—and with your mail ID, they now send you ads by mail. Then there's Salon.com: you need to get a "day pass" to get to the site, and you do that by watching an ad for a while. Then there are these gentler sites that say, "Such-and-such is brought to you by our sponsor—click here to continue." And the sponsor's ad appears below that text, but who bothers to wait for it to load? You just click the button!

We can't predict *when* this will change, and only time will tell—but it's bound to happen.

### AN ANTI-PIRACY CHINA?

## Computers Must Have OSes

Wang Yefei, a senior executive from the Beijing Copyright Bureau, recently announced that China would crack down on system assemblers who sell systems without operating systems, as this was leading to piracy.

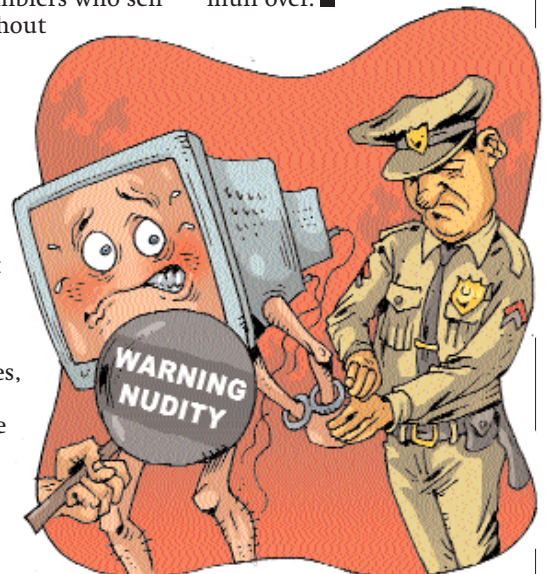
He also announced that no government department would buy computers without OSes, and all locally-made or imported computers would require to be shipped with the OS.

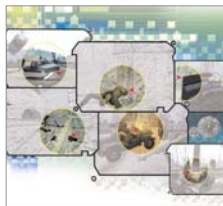
Obviously, reporters were quick to ask if the government had thus far been purchasing computers without operating systems, or loading pirated software... the response was a hasty statement that all government agencies use legal software!

Jokes apart, the move on the Chinese government's part might actually help reduce piracy in China, which has been cracking down on software pirates since early 2000. Statistics state that China has "detained" over 13,000 Intellectual Property Rights (IPR) violators, who have caused losses of an estimated \$600 million (Rs 2,700 crore).

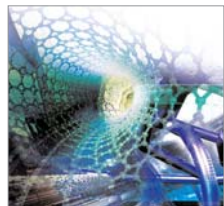
Of course, China can afford to police its people the way it does, while other countries cannot. Imagine if you were being forced to buy a computer along with Windows XP just because your system assembler didn't know how to install your favourite Linux distro: sure it would help curb piracy a little, but do we really not care about all the software, other than the OS, that is pirated?

Whether or not this move actually helps China crack down on IPR violators only time will tell. In the meanwhile, it's something for our own Government to mull over. ■





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Digital

# Passion

Fuelling the pursuit of technology knowledge

Lead Feature

## The Revolution Will Be Televised

**More reasons to stay home, plug in, turn on and cop out. The revolution will be live over the Internet with IPTV**

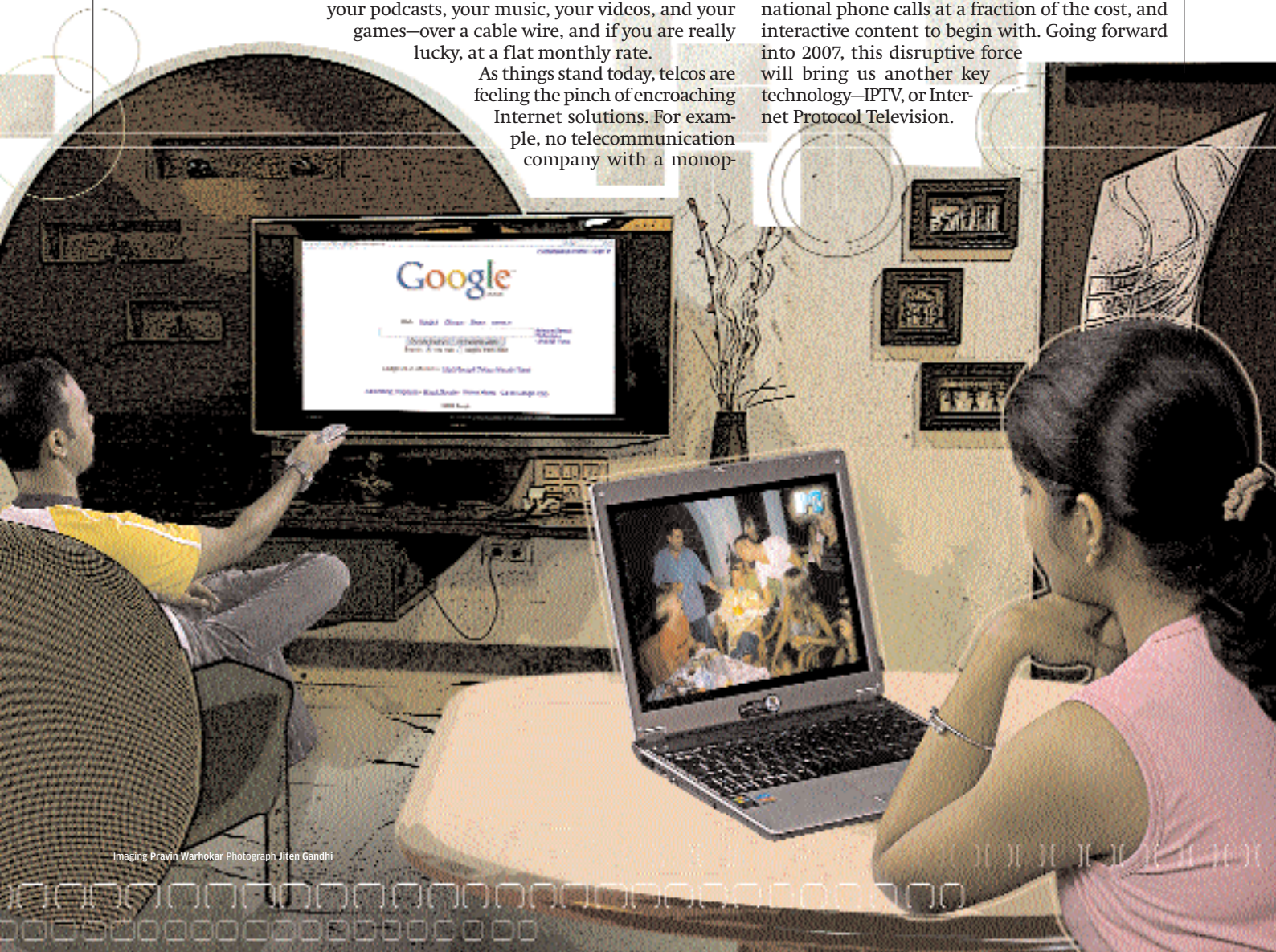
Ahmed Shaikh

**S**ometime between turning on the tube to Chhayageet on Doordarshan, and switching channels to spend late nights with Conan O'Brien, the Internet happened. Suddenly, we had this nebulous mesh of wires that magically connected every computer in the world with every other. If data could be broken down into IP-sized packets, it could now be transmitted over this Web. Today, you thus have a network that can bring you your work, your personal e-mails, your phone calls, your video conferences, your blogs, your podcasts, your music, your videos, and your games—over a cable wire, and if you are really lucky, at a flat monthly rate.

As things stand today, telcos are feeling the pinch of encroaching Internet solutions. For example, no telecommunication company with a monop-

oly to protect is happy over VoIP and the cheap long-distance (or even free) phone calls it delivers. But VoIP is just the tip of the iceberg: today Wi-Fi-enabled handsets can completely eliminate the need to make a phone call via the traditional channels, local or overseas. Tomorrow, when WiMAX throws a much wider wireless blanket over cities... well, it won't be the happiest time to be a telecommunications company.

While the Internet has thrown a spanner in the business machinery of many an industry—from music to telecommunication—as a disruptive technology, it is forever changing the status quo. Music downloads for 99 cents a song, international phone calls at a fraction of the cost, and interactive content to begin with. Going forward into 2007, this disruptive force will bring us another key technology—IPTV, or Internet Protocol Television.



Imaging Pravin Warhokar Photograph Jiten Gandhi

For telcos, IPTV is a promise of a wide range of revenue streams. When you consider the fact that IPTV is essentially an Internet line connected to your television, you can imagine it opening the doors to a gamut of Web services, be it data, video or voice. Telecommunication companies would like to become your sole communication link and your only source for both non-interactive and interactive entertainment. And they are betting on IPTV to take them there.

You will thus find phone companies jumping onto the IPTV bandwagon. Already, Reliance has announced its intention to roll out services leveraging this technology by the end of this year. Other telecom players such as Bharti (Airtel), BSNL and VSNL have also reported their plans to enter this segment.

### How does it work?

If you have ever watched a video streamed over the Internet, you have already experienced IPTV in its broadest sense. Simply put, the technology leverages the Internet to bring you television. However, while the video you streamed over the Net was very likely a stuttering, pixelated, low-resolution Aishwarya Rai number, IPTV will bring you content as you expect and demand from TV—smooth, and at high resolution.

So how does it work? Let's stick to Aishwarya to understand that. Say your friendly neighbourhood telecom operator has licensed the rights to telecast the latest and the hottest item number featuring Ms Rai. First step at the telecom HQ would be to encode the raw video into a format more suited to streaming. While they could stick to MPEG-2, better compression would be afforded by a more up-to-date codec, such as H.264 or Microsoft's Windows Media format. (Incidentally, Reliance and Microsoft have signed deals to the effect that the former will use Microsoft TV as the software powering its IPTV offering.)

Right, now that we have a video clip in the required format, it is then broken down into IP packets to be compliant with the way the Inter-

net works. These packets are then multicast from a central HQ to local operators.

A multicast message is one that is transmitted to multiple recipients simultaneously—thus, while a broadcast message is sent to everyone, a multicast message is sent to specific groups; called multicast groups. The biggest benefit is that of bandwidth conservation.

To better understand the concept of multicasting, picture a tree: its trunk is the backbone of the entire structure, the one with the maximum bandwidth. The trunk then breaks into branches, and the branches then sprout leaves. Imagine data flowing through such a tree. A multicast stream would be transmitted only once from its trunk, through the major branches, and would then be distributed (multiplied, or technically, multiplexed) out to the leaves. A multicast data stream is thus a single stream until it reaches its endpoints. In the case of IPTV, each channel is multicast to several endpoints. Later on, we will see how this helps.

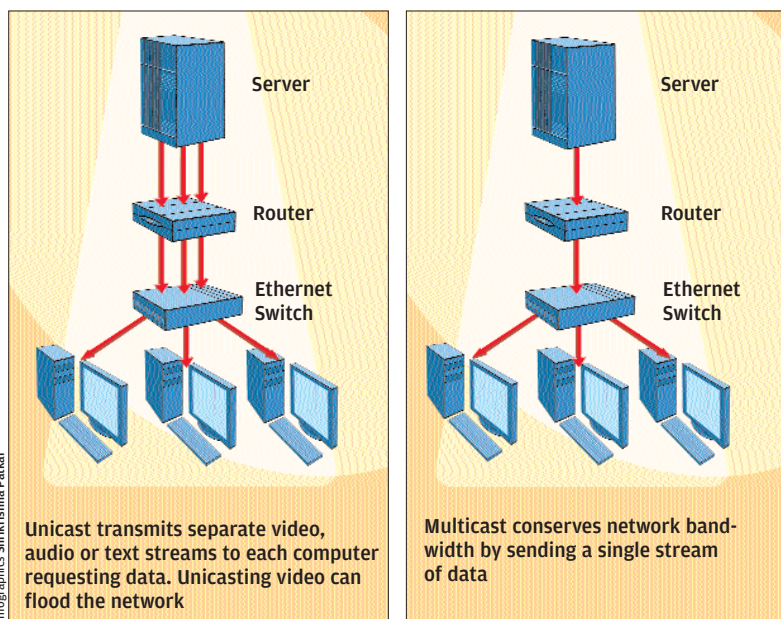
Internet guru Dave Clark describes the multicast model thus: "You put packets in at one end, and the network conspires to deliver them to anyone who asks [for them]". In our example, content is multicast to local operators, or from the network's perspective, to the local routers.

Before we head further, we would like to point out that the decoding of the Aishwarya video and its eventual streaming is a very one-dimensional view of what really transpires. The telco's HQ is a hive of network activity. This hub handles all sorts of data, including traditional voice content, video, high-quality music, e-mail packets from the Internet, etc. This hub-side view allows the HQ to guarantee a high level of quality over their streams. It also allows them to prioritise these streams to maximise the available bandwidth. Note that since each stream is multicast, there is no way for an end-point to request corrupted content again—to allow for this inflexibility, multicast streams transmit redundant packets. All this ensures that hassle-free and high-quality content is just a remote control away, without breaking the plug-and-play spell of our TV sets.

Back to our scheduled program: the video stream has reached the local operator. This is where all the boring and invisible, yet important, bits go in, the most important being the software controls. Here you would have elements controlling user authentication, user billing, channel change requests, video-on-demand requests, advertisements, and so on.

At a user's end, the connection goes into a set-top box, which arranges the packets and then decodes the incoming signal for your TV set. We said each channel was multicast to several endpoints, and that this was a good thing; now, note that the set-top box is acting as an end-point to the multicast content. Each channel is sent to a particular multicast group. Thus, when you change the channel, the set-top box simply changes its multicast group. This is as good as instantaneous, and thus, when it comes to IPTV, surfing through channels should be faster than ever.

The "last mile" to the user can be either over DSL twisted-pair or over cable. Rarely, this could also take place over optic cables, making for an



Infographics: Shikishma Patkar



end-to-end optic solution. Generally though, DSL is what would be used, seeing as we are talking about phone operators. The bandwidth afforded by a DSL loop is considerably less than ideal. However, since not all channels are simultaneously multicast, the problem is greatly alleviated.

### An Interactive View

One of the benefits of IPTV is video-on-demand, or VOD. It means exactly what it implies—instead of waiting on your favourite show, you can watch it when you want to. This generally works with the help of a VOD server, which stores content made available for such a demand, and handles requests to that end. A multicast stream, however, does not allow for VOD. This is because VOD is essentially a unique service—like Batman's hotline to Commissioner Gordon! To enable this feature, the local operator creates a unicast stream to your house. This stream connects your TV to the VOD server mentioned, opening access to all your *Saas Bhi Kabhi Bahu* needs.

You also get VCR-like control over a video stream. This allows you to pause, rewind or forward a show as you see fit. IPTV can also bring digital video recording (DVR) to your TV, if such functionality is offered by the set-top box. A DVR-enabled box can be used to record important cricket matches, for example. Over IPTV, a DVR can not only record a show while you are watching another, it can also record multiple shows simultaneously (bandwidth willing). Since all this is digital, you can also see multiple picture-in-picture applications.

As we touched upon earlier, the telco at the heart of all this handles more than just video. Imagine the service leveraging its access to the Internet to bring you your e-mail, or its access to the phone lines to bring you your phone calls. Imagine then, a scenario in which you are notified by a small pop-up of an incoming e-mail while watching a show. Or imagine taking a video call as a picture-in-picture overlaid on a football match that just *cannot* be missed.

There will also be the relatively mundane enhancements to your TV experience: interactive TV guides on your favourite shows, perhaps linked to user reviews and ratings. Pay-per-view could also be offered via such guides.

Another great functionality could be a process wherein you only pay for what you watch, although this is unlikely to happen—channels generally wrap their hit shows with assorted crud, and will therefore continue to offer, and charge for, so-called bouquets... of crud.

### Vive La Révolution?

IPTV is not the only means of viewing video content over the Net. Services such as YouTube ([www.youtube.com](http://www.youtube.com)) allow users to share video content over the WWW. Even Google is on it, with its Google Video service, which is unfortunately not yet available in India. We can imagine an amalgamation of content sources and a variety of streams that will entertain us in the years to come. Take Google for example: in the US, it plans to cover cities with Wi-Fi access; free, ad-sponsored Wi-Fi at that. Down the line, Wi-Fi can be replaced with WiMAX with its mile-wide blanket of coverage.

AOL recently unveiled In2TV—a streaming TV Web site accessible over the Internet. Apple with its iPod/iTunes combination, and Microsoft with its PlaysForSure/Windows Media devices, can both offer a wide range of audio and video content over personal computers, laptops, PDAs, portable media players, and so on.

Pretty soon, everywhere you turn, TV will be there, waiting. You will no longer need to stay home to be able to be able to plug in, turn on and cop out. Question is—is that a revolting or a revolutionary thought? ■

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Rooman Technologies, India's no.1 Networking and Internet Security Training Institute with 35 branches across India and one each at Colombo, Dar-e-Salam and Toronto, invites franchisees from all over India, as per it's expansion plan.



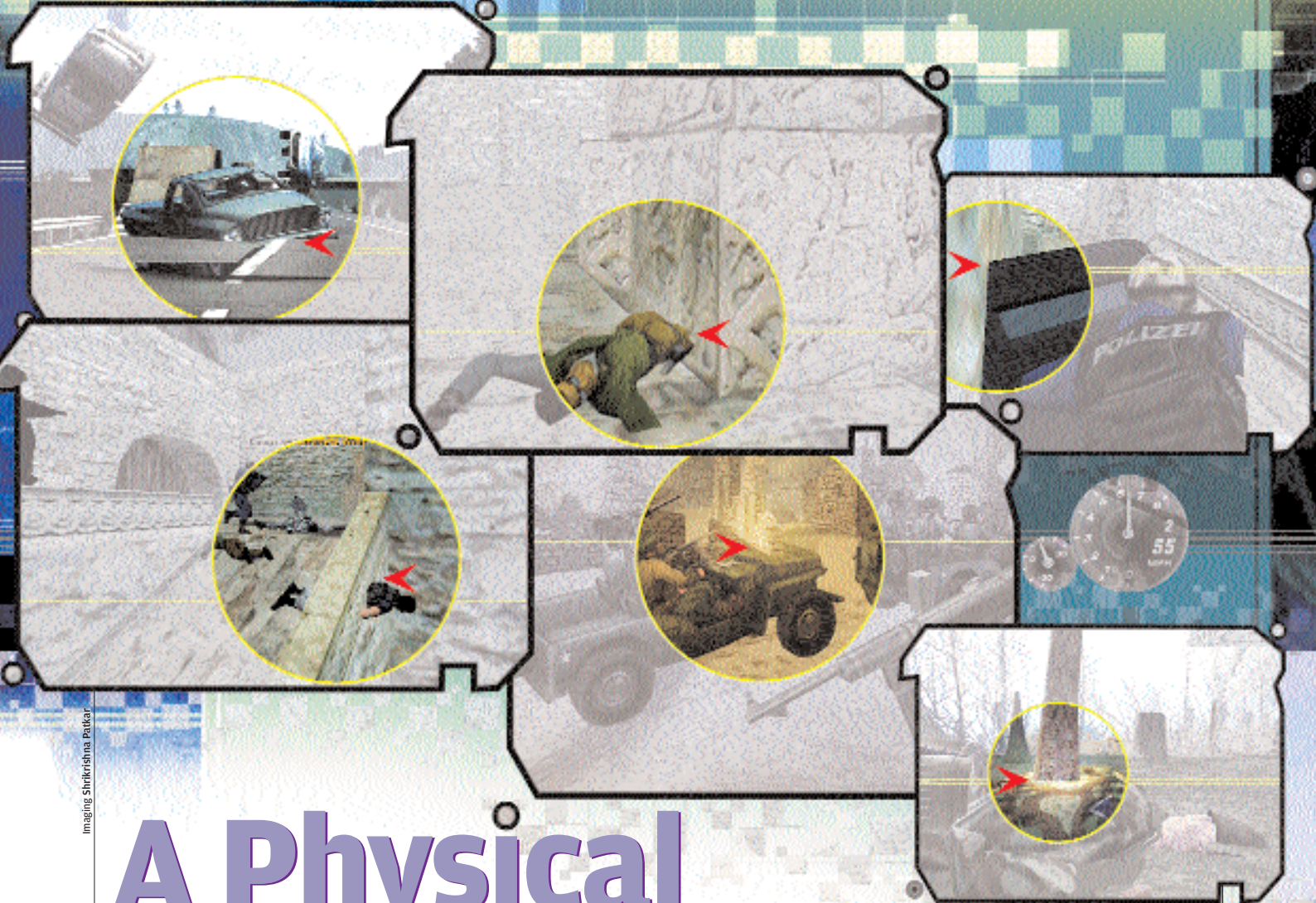
[www.rooman.net](http://www.rooman.net)

A recent MAIT and Ernst & Young research report has revealed that the Indian electronics hardware sector is expected to touch \$42 billion by 2010. The requirement for hardware manpower is estimated to be 12 lakh by 2010. Network security, WAN and wireless network administration were popular courses in 2004-2005 and indicated potential for further growth too. India urgently faces a shortage of around 200,000 IT and ITES professionals. The shortage is bound to grow to 1.4 million in the next eight years. According to

a Nasscom-Mckinsey study, India needed at least 130,000 IT professionals in 2004, but manpower still lags behind by 175,000. In 2006, there is another 400,000 fresh demand to be met. It will increase to another 900,000 in 2009 and by 2012 it will reach 1.4 million. Considering the above survey and observing the global market, there has never been a better time to invest in Networking and Internet Security Training. Both sectors. Individually and jointly are poised for remarkable growth.

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Imaging: Shrikrishna Patkar

# A Physical Presence

**Your gaming experience isn't quite what you want it to be because your CPU can't keep up with the physics computation required by current-generation game engines. That's about to change...**

**Robert Sovereign-Smith**

In human years, an era could last for decades or even centuries, as we all learnt from our history textbooks—however, in tech time, an era rarely lasts even a decade.

For a very long time now, the graphics card era has reigned supreme in the gaming world. We've all enjoyed watching the giants in this field, NVIDIA and ATI, battle it out, and reaped the benefits—at a steep price of over \$500 (Rs 24,000) a card of course! It's come to a point where the GPU (Graphics Processing Unit) is far superior in terms of floating point units computed than the CPU. Of course, it's a little unfair to compare the two, because a CPU needs to be a lot more general in its application than the GPU, which is designed and built to do just

the mathematical calculations required to render video in real-time—but the pure calculating superiority of the GPU cannot be ignored.

Not since the emergence of GPU technology for the PC, and the emergence of PC gaming, almost a decade ago, has anything changed significantly in terms of hardware. It will now!

## Are You Insane?

A lot of you are thinking, "Nothing's changed? What has this writer been smoking?" Sure, cards got faster, transistor and die sizes shrunk faster than a roadside pair of jeans in your washing machine, and the resulting graphics went from jagged edges to the surrealism of today. It was still nothing revolutionary, not in the pure technological sense! Ever since graphics processing loads were taken off the CPU and transferred to the GPU, we sort of

reached a stalemate. Games have gotten a lot prettier, and most of us swear we could smell the ocean in *Far Cry*; but then you sneak up behind a couple of baddies, shoot one, his friend somehow doesn't hear the shot you fired from three feet away—from a shotgun, no less—and keeps on walking his predefined sentry line, and you are rudely awakened and brought back to reality. How many times have you shook your head in disbelief and disgust at in-game physics and AI? Even the prettiest-looking games have terrible physics.

Of course, of late, game developers have begun adding some wonderfully realistic physics computation into their engines—and what better example than *Half-life 2*'s Gravity Gun to exemplify these? But who are we kidding? All of us know the difference between a game setting and actual video footage—and it's not the characters or backgrounds that let the cat out of the bag! Have you ever seen an oil spill in a game? It looks more like black coloured water than oil. What about when you're climbing a hill (in a game, of course), the way the rocks tumble down the side of the hill you're climbing just looks fake! The same applies for the flow of water in a stream; ditto for the way a glass window shatters when you shoot a bullet through it, or the lack of any mark or bullet holes in the wall you just emptied a clip into. To get into some morbid details, it's also unrealistic when you shoot a guy in the foot two or three times and kill him—makes us wonder if he died in relief after finally getting rid of that nagging pain his ingrown toenail has caused him for years!

### OK, It's Unrealistic, But So What?

Now that we've made our point about the idiotic physics in most games, let's see what can be done about it! Those of us who have had the pleasure of playing games with great physics engines, such as *Half-life 2*, will vouch for the fact that more realistic physics is already possible—it's just a matter of creating or coding the game engine that way! So what's stopping the developers?

There's the minimum system requirement problem: developers just cannot make a game that only runs on four computers in the world—that would be a rather idiotic business decision. So, games are developed so they can be played on most mid-range to high-end modern computers. This means that even though you have a dual-core 4 GHz CPU and 4 GB of RAM, you're playing a game that was also developed with your neighbour in mind, who has a mere 1 GHz CPU and 256 MB of RAM. Sure the game will look prettier on your 7800 GTX than on his TNT2, but the physics will remain the same for both. After all, the game was probably designed to be able to calculate its physics on an 800 MHz CPU!

### That's Not Fair!

Sure, but how can you change the fact that game developers actually have companies to run, and will always program with minimum system requirements in mind? Change the way PCs are built, of course...

And that's exactly what American company

**A lot of developers have already begun developing games that interface with Ageia's technology to offer much more realistic physics engines**

Ageia Inc. plan to do!

Ageia is a fabless semiconductor company, and is the first to develop and sell a PPU (Physics Processing Unit), called PhysX, to the general public. They have developed the hardware and software, but do not manufacture the PPUs themselves—they leave the manufacturing and selling to companies such as Asus, Alienware, Dell and Falcon Northwest.

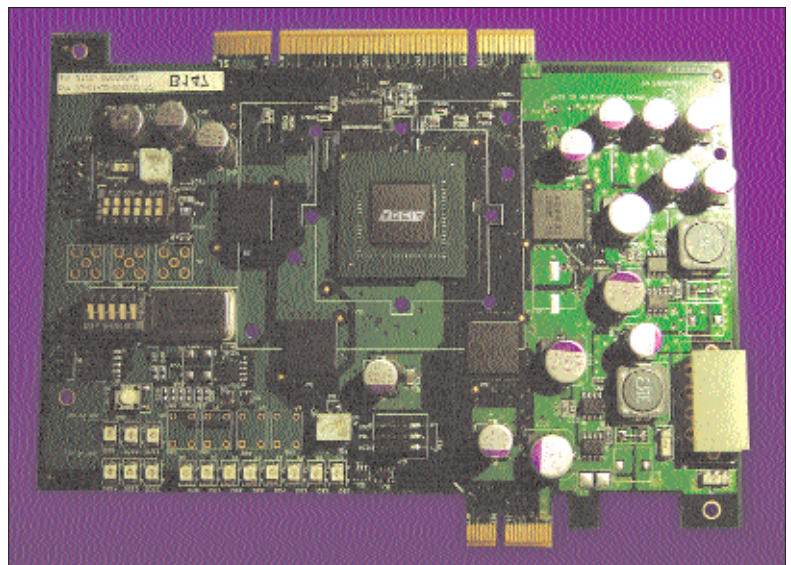
This news is not new to the technology world: Ageia have been showcasing their designs and PPU for some time now. In fact, a lot of developers have already begun developing games that interface with Ageia's technology to offer much more realistic physics engines. You can already go out and buy the Ageia PhysX card—provided you're in the US, of course—as well as a few games that have already been tied into Ageia's technology. A few examples of already-released games are *Rise of Nations: Rise of Legends* and *Tom Clancy's Ghost Recon Advanced Warfighter*. The most noteworthy "soon-to-be-released" game that will showcase the PhysX technology is *Unreal Tournament 2007*.

### So We'll All Have PPUs Now As Well?

If you want to have the very best in terms of gaming hardware, yes! Of course, as with other gaming hardware, PhysX will not be cheap. We're not very sure about the prices right now, but the guesstimates say between \$200 and \$400 per card. That's about another 15 thousand rupees you'll have to spend on your gaming rig!

For the first time since graphics and processing computation were separated into the GPU and CPU respectively, the hardware business is in for a complete revamp of sorts. Though PhysX cards will only be available as PCI or PCIe cards initially, motherboard manufacturers, such as Asus, are already looking at integrating PhysX into their boards. Be prepared to see much better-equipped onboard graphics solutions from major motherboard manufacturers soon.

Of course, this innovation will find its way into the consoles soon enough, but it's the PC



Here's the Ageia PhysX board that promises to revolutionise gaming for us all



Here you can see the incredible fluid dynamics that the PhysX PPU makes possible. The picture shows soap bubbles on a car being washed—realistically!

that we're interested in right now, and the PPU is surely the most phenomenal thing for PC gamers since the coming of age of the GPU!

### What Will Improve?

In order to better understand the differences between the physics computations that a really high-end CPU can achieve, and what a PhysX-powered system can achieve, head to <http://physx.ageia.com/footage.html> and [www.ageia.com/standalone\\_pages/ageia\\_physx.aspx](http://www.ageia.com/standalone_pages/ageia_physx.aspx). The difference between an explosion now and after using PhysX is:

*Normal:* "Boom, clang, crash, poof (smoke clears and guy standing more than 10 metres away from explosion doesn't even blink)"

*PhysX:* "Kaboom, clang, crash, clang (x100), crash (x50), poof, (smoke billows, and people standing 20 metres away, as well as you yourself, get a little damage due to the flying shrapnel)"

This means you cannot run around a map carrying a rocket launcher, because you'll only succeed in blowing yourself up—but who said you could do that in real life anyway? Realism is the key, and PPU solutions will soon have us believing. For one, PhysX promises more realistic explosions, where things that explode actually do so into thousands of pieces—and all of them random-sized of course, not like dividing a truck into a thousand equally-sized pieces and then exploding it! There will be interactive environments, so you can actually destroy a building if you have enough firepower, or at least make a hole in a wall. Everything in a map could be made destructible if the game engineers so desire. And, of course, when you're destroying stuff, explosions, fire and gas will behave like in the real world.

Apart from the object interactions we're raving about, PhysX will also mean more realistic fluid dynamics—so oil will look and flow like oil, and smoke will *not* travel through a wall or pillar, but behave more realistic. Many of you would have noticed that, in games, smoke

behaves the same way outdoors as it does indoors. Sometimes a game's physics is so ridiculous that it will depict trees and grass waving in a strong breeze, yet the vehicle you just blew up will send up an absolutely straight column of smoke that doesn't disperse. Also, when indoors, you would have seen smoke actually going through a door and just disappear when it hits the ceiling; in reality, smoke would collect at the ceiling and then spread outwards, slowly engulfing the whole room in a black, acrid fog. PhysX promises experiences like these in games that will be developed using their software and hardware technology.

### But What About ATI And NVIDIA?

In any talk about gaming, you cannot forget about the two graphics giants. Both companies seem to be convinced that they will soon make the need for a separate PPU, GPU and CPU combination redundant. Both feel their GPUs are powerful enough to do physics computations, and that it's just a matter of utilising all the gigaflops of processing power that are not used on their latest-generation cards.

NVIDIA has tied up with Havoc, a company that has done physics simulation work for some of the biggest game developers in the world, to create the Havoc FX Engine. This engine is basically a software solution that will command the CPU to send physics processing load to the GPU. According to reports, the FX engine will work with both single as well as multiple NVIDIA GPU-based systems (SLI). However, the cards that will support running this software will have to be 7600 or higher series cards. Now this isn't ideal, because the majority of people using NVIDIA's products own 6-series cards (such as the 6600GT). Of course, even with the lower penetration of NVIDIA's 7600 series and above cards (7900 recommended), they're still a lot better off than Ageia, who are starting from naught!

According to NVIDIA, even using a single high-end 7-series card to do your physics processing will increase the amount of physics processed. In terms of evidence, they provided a fixed amount of physics processing (15,000 boulders colliding). They read frame rates for when the CPU did the calculations, and compared it to the GPU taking over the physics calculations. The results sound too good to be true: the CPU managed 6.2 fps while the GPU managed 64.5 fps! The same GPU pair (for SLI mode) was used in both tests, so it wasn't a with-and-without-GPU comparison!

If NVIDIA can reproduce this success with physics processing in real world tests, Ageia may already be in trouble. With almost every NVIDIA-loyal gamer buying (or at least saving for) an SLI pair of cards, a lot of people are going to have a lot of free computing space on their GPUs which, if Havoc FX does what it promises, will eliminate the need for a separate PPU!

ATI are convinced that their Crossfire solution will soon have both NVIDIA and Ageia licking their wounds. According to them, their latest brands of graphics chipsets already have physics processing capabilities. They're already working on an API that will give a game direct access to their GPUs, thus significantly reduc-

ing CPU load. This means that even the Direct3D and OpenGL API layers can be skipped when processing physics, which is a sure-fire way of increasing performance.

Another great advantage ATI has is that their Crossfire cards need not be identical (as SLI forces you to do), and so if you've just bought an X1900XT, and a few years down the line decide to upgrade your graphics card, you need not throw away or sell the X1900XT. All you need to do is force the physics processing on this card, so you save a lot of money and get a very high-end graphics from the newer card at the same time. In fact, ATI claim you need not even be running the cards in Crossfire mode: so long as an ATI card is installed in a PCIe slot and powered, it can take over physics calculations! A boon indeed!

### The End Before The Beginning?

No, don't write off Ageia just yet. In order to make completely interactive and realistic worlds, the physics calculation power required will increase *exponentially*! As games get heavier, and system requirement stats soar to all-time highs, most gamers would prefer to have a separate device that does physics computation and also allow them to eke out the maximum from their GPU cards. After all, getting great game physics at just 20 fps is not something we want. We'd rather spend Rs 10,000 or so extra and get great physics at 60 fps!

The bottomline is that Ageia admits that currently, even a GPU will show vast improvements in current physics rendering, but says that once game developers start using advanced collision and fluid dynamic physics in their offerings, the GPU will struggle. Of course there's no telling whether ATI or NVIDIA will revamp their architectures to increase the memory bandwidth, or not! For now, Ageia's PhysX is the only offering that promises integration with upcoming games, and also offers a more realistic feel.

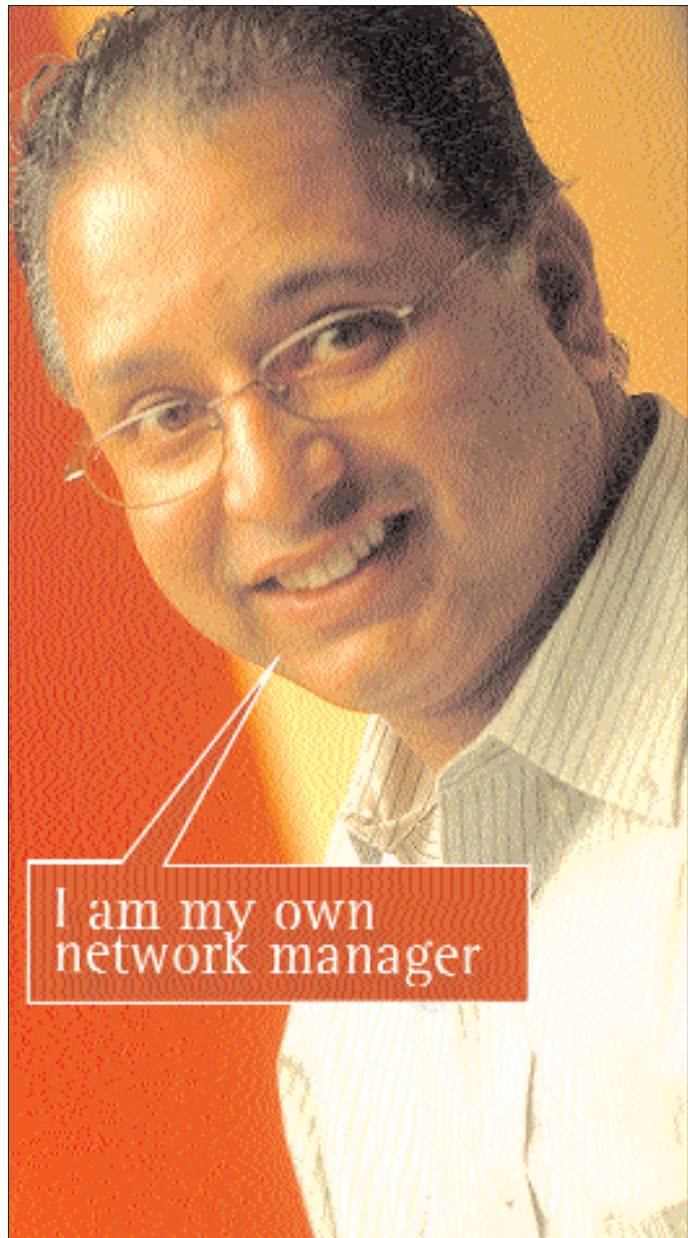
Another point to ponder is that there's no common driver API for PhysX, NVIDIA or ATI, and this is already cause for concern. Game developers are *not* going to make four different versions of a game, one for regular PCs, one for Ageia's PhysX, another for NVIDIA and yet another for ATI. So a standard is needed, and, as usual, everyone's hoping for some intervention from Microsoft here—since most games are made for the Windows platform anyway!

Also, Ageia has a huge head start over NVIDIA and ATI: games have already been developed for its PhysX cards, which are already being retailed, whereas both the graphics giants are only just contemplating the development of methods by which their GPUs can do physics computation.

Whatever the outcome of the battle that's brewing, one thing's for sure: the game industry is set to smash all previous records, and reality will finally enter the game domain! Life has never been this good for us gamers! ■

robert\_smith@thinkdigit.com

**Editor's Note:** Turn to the next page for a Visual Explanation of how a PPU works!



I am my own  
network manager

Technology is not your profession. Yet, as a small business owner you have to deal with it everyday. From your workstations, printers and all those pieces of hardware to managing your intranet, the accounting software and keeping those viruses away, your business depends on technology.

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# Move Over Silicon

**The fundamental building blocks of circuits—transistors themselves—are in for a makeover**

Ram Mohan Rao

“The chip industry is facing a roadblock”—that’s something we’ve been hearing for some time now in various forms. What we’ve also been seeing for some time now is that these “roadblocks” never seem to do anything—someone finds a way to get round them, and then there’s another roadblock. Nothing exciting seems to be happening, as in “machines will *not* get any faster after 2010!” The tech juggernaut rolls on.

However, there is one thing common to most of the problems hardware researchers face: it’s always about miniaturisation. Things are always getting smaller and more powerful (as if you didn’t know that)—but the remarkable thing is that Moore’s law or Kryder’s law (a sort of Moore’s law for hard disks) or whatever law keep on holding true.

## Tech 2020

We can’t resist talking about Moore’s “law” here. We say “law” in quotes because it isn’t, of course, a law per se: it’s an observation, one that says that the number of transistors on a chip will double every eight-

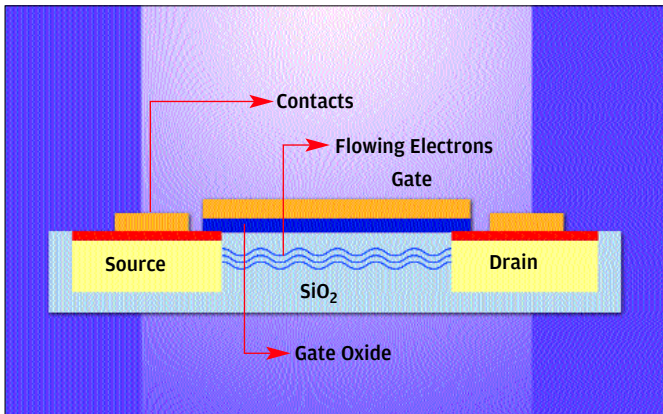
een months. Or should that be “two years”? And “the density of components on a chip”? It’s not important—it’s only an academic exercise in history to find out what Gordon Moore originally said. What’s important is that things will shrink exponentially, and that usually means that capacities and speeds and such will increase exponentially as well.

Now there’s the 2018 thing to contend with. Industry analysts predict that Moore’s law will hold good only until 2018, or generally, around the year 2020. Their point: that the shrinkage of silicon transistors cannot continue indefinitely, and that by around 2020, we’d have reached the stage where they cannot be shrunk anymore. But that’s about *silicon*—what about other materials? Enter silicon’s cousin in the periodic table, *carbon*.

## The Stuff Soot Is Made Of

NEC’s Sumio Iijima is reported to have been the first to observe, in 1991, carbon nanotubes. He saw them in electron microscope images of—of all things—soot. The nanotubes were essentially sheets of graphite rolled into concentric cylinders—one cylinder inside another; such structures are called multi-walled nanotubes. And in 1993, Iijima and IBM’s Don Bethune found, in research independent of each other, that they could produce *single-walled* nanotubes, that is, no tubes within each other. These consist of a single atomic layer of the graphite structure, and look something like a hexagonal wire-

Imaging Pradip Ingale



The (simple enough) structure of a typical MOSFET. The electrons flow from the source to the drain through silicon, and are controlled via a voltage applied to the Gate

mesh rolled up, as in the figure alongside (See figure A *typical single-walled carbon nanotube*). It is these structures we're interested in; we'll refer to them simply as "nanotubes"—and we'll come back to them later.

### The All-Empowering Transistor

To tie up some of the things we've talked about, the idea is that the transistor is the basic building block of most ICs (Integrated Circuits), and it is transistors that do the actual, atomic-level switching of ones and zeroes. When you say a computer works in binary, we mean that it handles only ones and zeroes—simple enough; but this is true even at a much more fundamental, physical level. All of computing is, in a hardware sense, about switching between a high voltage and a low voltage. It's the transistors that do that.

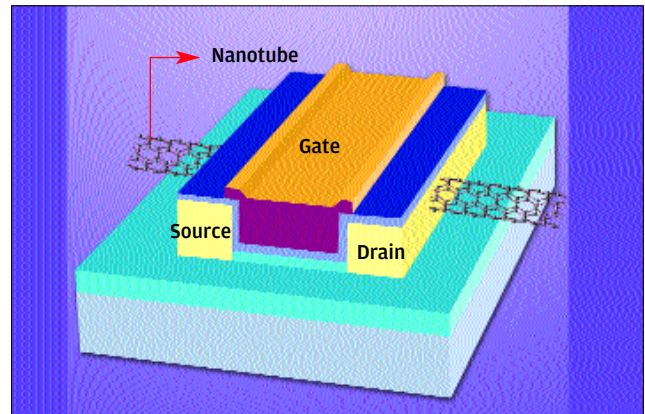
Now, when we talk about the 65-nm manufacturing process, we mean that the conducting lines on the chip's silicon wafer that connect the transistor are 65 nanometres wide. As this figure goes down—that is, as we move to the 40nm or even 20nm process—the transistors are getting smaller. As they get smaller, the chips they comprise get faster, more powerful, and all that. You know the rest of the story—the world demands more computing power, there's a lot of money to be made, and so on—hence we keep shrinking the transistors, amongst other components.

Around 2020, it will not be possible to shrink current-gen-type silicon transistors any more, and that's where nanotubes come in. They will replace the silicon, co-existing with silicon in the interim, and Dr Moore will live on in our hearts and minds.

But to understand what's going to happen in 2020, we need to understand how a transistor works. A little digression...

### The Three-Legged Beast...

...called the transistor revolutionised electronics, and therefore everything that depended on it, when it was invented in 1947 by Shockley, Brattain and Bardeen. It's a box with three legs—the source, drain, and gate. The source is where electrons come from; the drain is where



This is something like a MOSFET that has a nanotube built into it. Electrons flow through the nanotube instead of through silicon

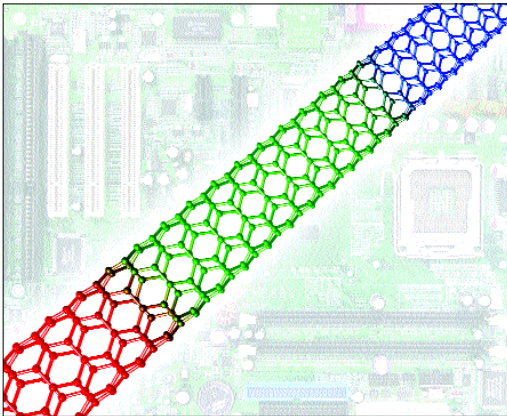
they go out from—and the path through which they pass is called the channel. The gate is what controls the flow: an appropriate voltage applied to it reduces the conducting ability of the silicon channel inside, and there won't be any flow of electrons—gate locked. The gate can be opened by a different voltage applied to it. There needs to be an isolation between the channel and the gate, which in the case of MOSFETs (Metal-Oxide-Semiconductor Field-Effect Transistors—one type of a transistor that's used most frequently in ICs today) is a layer of insulating silicon dioxide.

Applying different voltages to the gate therefore has the effect of the transistor storing either a one or a zero—that is, a bit. The transistor is thus a switching device. In a nutshell, that's how you get your ones and zeroes—voltages applied to the gates of transistors.

### The Shrinkage Barrier

For decades now, transistors have kept getting smaller. So what'll happen in 2020? Not to get into the details, MOSFETs are the most common type, like we said. Taking the MOSFET as an example, several things will happen when you try to shrink it beyond a certain point—to be precise, when you decrease the channel length and the thickness of the gate insulator.

The quantum mechanical effect called tunnelling (see *Jargon Buster*), amongst other effects, begins to take over. The leakage currents that result are too large, and render the transistor possibly useless as a switch. On top of that, leakage currents add to the power consumption of devices scaled at this level, as if the current high power consumption weren't enough. Then there's the matter of the thickness of the metal wires that connect the transistor to the rest of the circuit: this needs to be reduced, too. And reducing this width leads, by the laws, to increased resistance—meaning a slowing down of performance, and the phenomenon called electromigration (see *Jargon Buster*). Electromigration decreases the reliability of the IC, and can even sometimes lead to the loss of a connection—and hence, failure of the entire circuit.



A typical single-walled carbon nanotube. Of course, this is an artist's impression—they aren't really so colourful!

Finally, the resistivity (see *Jargon Buster*) of the interconnects, too, increases as the width of the interconnects gets close to the mean free path of the electrons, which is the average distance the electron travels before encountering a collision. This happens as a result of "electron scattering" in the metal—the electrons getting deflected from their path—and increased resistivity means more power required to pump the current through.

### Enter The Carbon Nanotube

Nanotubes are extremely interesting little things. They can be good electrical conductors—meaning they can be used as nanowires (a regular wire at the nanoscale)—and they can also be good semiconductors. They have several other exciting characteristics important to different types of researchers, which we won't be going into.

Constructing a MOSFET using nanotubes is something like replacing the silicon channel with a nanotube. Now, nanotubes can be treated as one-dimensional: they're so thin that, for practical purposes, you can forget that they have a thickness! One result of their one-dimensionality is that there is only two directions for the electrons to flow through them—backward or forward, and electrons flowing in the reverse direction ("backscattering") is highly improbable. This means lower resistivity than a three-dimensional wire under similar conditions.

The transport of electrons in a semiconducting nanotube is "ballistic," meaning that the electrons shoot straight forward, without any deflections along their way. This property holds on the scale of a few hundred nanometres—long enough for them to be used in MOSFETs. This means low leakage currents, which means low power dissipation—which, in turn, means low heat. There is also no electromigration. Switching times are faster—which means higher performance. And finally, due to reasons we cannot explain here, there will now be no need to use silicon dioxide as the gate insulator when a nanotube is being used: materials with higher dielectric constants (see *Jargon Buster*) can be used, which again means higher performance.

The picture is more complex than we've presented—so let's take a real-world look at what's been going on in the direction of actually using nanotubes in transistors.

### From Lab To Fab

May 2002 was a milestone month for nanotech. IBM announced it had created the highest-performing nanotube transistors ever, and proved that nanotube transistors could outperform state-of-the-art silicon prototypes. The proof centred around transconductance, which is a measure of how well something carries electrical current; the researchers involved reported they had achieved the highest transconductance of any carbon nanotube made thus far, and also that their nanotube transistors had twice the transconductance of the best silicon prototypes. Higher transconductance means transistors can operate faster, and that the resulting IC will be more powerful.

Dr Phaedon Avouris, manager of nanoscale science, IBM Research, is reported to have said, "Carbon nanotubes are already the top candidate to replace silicon when current chip features just can't be made any smaller, a physical barrier expected to occur in about 10 to 15 years."

To go into the details a little, the scientists at IBM made Carbon Nanotube Field-Effect Transistors (CNFETs) in a structure that resembled a regular MOSFET, and that's how they were able to compare the CNFETs with regular silicon transistors. The gate electrodes were above the channel, separated from it by a thin dielectric (see *Jargon Buster*). This was to measure the performance improvements that could be

### Jargon Buster

#### Electron Tunnelling

A quantum mechanical effect, tunnelling is the mechanism by which electrons can cross a barrier they are not "supposed to." Think of it like you facing a thin waterfall: it is a barrier, but you can go through it. More scientifically, tunnelling happens because, at the atomic level, things can be waves and particles at the same time: when an electron tunnels through a barrier, it is acting like a wave.

#### Electromigration

Electromigration is the result of momentum transfer from electrons moving in an electric field to the ions in the interconnect material. Electromigration can lead to the electrical failure of interconnects.

#### Resistivity

Resistivity is the measure of how strongly a material opposes the movement of electrical charge through it. If two objects of identical dimensions have different resistivities, the object with the higher resistivity will have a higher resistance.

#### Dielectric

A dielectric is simply an insulator—usually employed as an insulating medium between conductors.

#### Dielectric Constant

This constant is the ratio of the charge-holding capacity of a condenser made with a certain dielectric material to the capacity of the same condenser with air as the dielectric. (see *Dielectric*)



achieved by reducing the gate-to-channel separation, which is an essential aspect of shrinking the transistor.

The devices exhibited excellent switching characteristics—switching is the essential function of a transistor—and high transconductance at low voltages. The researchers concluded that future CNFETs would probably outdo silicon transistors by an even larger margin.

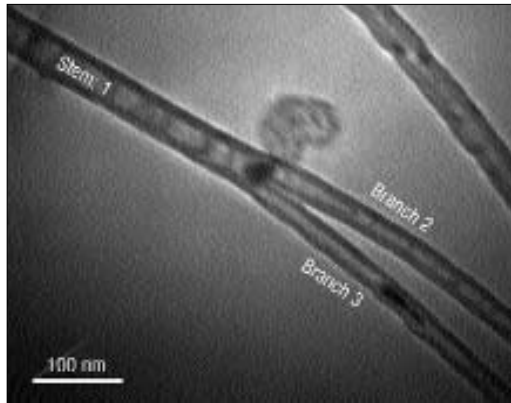
### Beyond Just Transistors

Developments followed thick and fast. In early 2004, researchers at the University of California, Berkeley and Stanford University created “the first working, integrated silicon circuit that successfully incorporated carbon nanotubes in its design.”

According to Jeffrey Bokor, principal investigator of the project, this was a first step in building “the most advanced nano-electronic products, in which (carbon nanotubes are placed) on top of a powerful silicon integrated circuit so that they can interface with an underlying information processing system.” In other words, nanotubes had definitively entered the Integrated Circuit.

Nanotubes are naturally difficult to manipulate because of their size, and another groundbreaking announcement came in late 2004: NEC developed a way of positioning nanotubes, while also controlling their diameter. (It was an NEC researcher, if you recall, who discovered carbon nanotubes in soot.) NEC’s goal was to develop chips running at 15 to 20 GHz (wow!) while consuming the same power as a Pentium 4—and this discovery was reported as an important step in that direction.

Not to be left behind, Intel announced in mid-2005 that it was stepping up its own research on nanotubes. Intel and other chip-makers will continue to use silicon for a long



A photo of a Y-shaped nanotube that can act as a transistor, developed by researchers at UC San Diego and Clemson University. The voltage is applied to the stem

time, but their foray into nanotechnology—and nanotubes in particular—is indicative of how important this field of research is right now.

### The Plot Thickens

August 2005 saw the emergence of something entirely new: it turned out that nanotubes could be transistors! At the University of



“Carbon nanotubes are already the top candidate to replace silicon when current chip features just can’t be made any smaller

**Dr Phaedon Avouris**  
IBM Fellow and manager of Nanometer Scale Science and Technology at the IBM T J Watson Research Center

California in San Diego, Prab Bandaru and colleagues, and Apparao Rao (hoorah for Indians abroad!) of Clemson University, constructed Y-shaped nanotubes that could act as transistors. Applying a voltage to the stem of the Y precisely controlled the flow of electrons through the two branches. This is revolutionary when you think about the sizes: silicon transistors measure about a hundred nanometres today at the state of the art, and these Y-shaped nanotubes are just tens of nanometres large. It’s almost unbelievable, actually: the transistors are fully self-contained, according to Bandaru.

In March of this year came an even more startling announcement: IBM researchers, working with researchers from the University of Florida and Columbia University, created an integrated circuit out of a single carbon nanotube. To be specific, they used an 18-micron long nanotube to build a 10-transistor ring oscillator, a type of circuit composed of an odd number of NOT gates. The IC is a million times faster than earlier ICs built using multiple nanotubes, but it clocks in at only 52 MHz—no GHz just yet!

But here’s a dampener: in regard to commercialising nanotube chips, Fred Zieber, an analyst at Pathfinder Research, said: “It’s a way off... It could be a few years or an eternity.” But remember that this comment is about all-carbon chips, not about nanotubes being used in transistors: if you recall, transistors that use nanotubes can already outperform their silicon-only counterparts.

### Looking Back

Nanotube research is on at various levels. Silicon and nanotube transistors can co-exist on the same substrate. Then there are efforts on to make nanotube transistors faster. The Y-shaped nanotubes that act as transistors are especially interesting, because that means no more silicon: and even more interesting is the recent development of an entire IC being constructed from a nanotube.

The major obstacles in all this are the manufacture of the nanotubes themselves—they come out as clumps of semi-conducting plus conducting types, and need to be filtered—and, of course, assembly, which is difficult because of the nanotubes’ extremely small dimensions.

### Looking Ahead

Things are moving fast: it was only proved in 2002 that nanotube transistors could outperform silicon ones, and in 2006, we’re already seeing an entire IC made of a single nanotube! There are many years to go—Intel’s roadmap, for example, contains several more generations of silicon. And it’s only in 2018 that Moore’s law—which seems to have envisaged only silicon—is supposed to die, as it were. Who can say what kind of research will happen in the next 12 years? We’re prepared for year 2018, and carbon might take over even before that. Now that is a happy ending! ■

ram\_mohan@thinkdigit.com

# The Amazing Tomatoboy!

**Dangerous Dave!  
With tomatoes!  
By a twelve-year-  
old! More!  
Exclamations!  
Please!**

**Nimish Chandiramani**

**E**veryone loves a good tomato. They're a wonderful round shape, red, healthy, and look excellent when generously splattered over the faces of bad performers. They've inspired everything from cheesy action movies to Web portals, confirming what we've believed all along—anything with tomatoes is always fun. Disappointingly, though, there is a shortage of tomato-inspired games out in the world.

Imagine our joy, then, when a young reader sent in a little game called *Go Tomatoes!* to put on this month's CD for our readers (which we have). Apart from being one of a rare breed of tomato-games, this one caught our fascination because it was *created* by said young reader!

## The Man Boy

To the untrained eye, all twelve-year-olds are quite the same—small, a little squeaky, a little annoying, and will probably get off your back if you put them in front of a video game. But every once in a while, when the planets align themselves just right and the sixth moon of Saturn sneakily enters the fifth house of Alpha Centauri, you come across one like Shashank H R. Not content with just playing them, he *creates* games of his own to satisfy his friends' (and now our) daily requirement of amusing activity.

This sixth-standard student from Bangalore likes playing racing games like the *Need For Speed* series, and also takes in a healthy dose of real-life games such as table tennis. He's also learning MS Office and Macromedia Flash on his own!



## The Growing Fascination

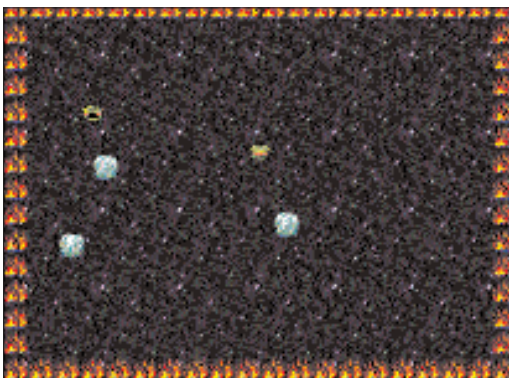
It all started during a computer class at school—Sri Kumaran Children's Home. The teachers introduced the class to making games using a tool called Game Maker (and you thought schools only taught boring stuff like programming), and Shashank was hooked. He started experimenting with the program himself, soon leading to his first game—*Burger in The Oven*. The game itself is quite basic—just click on the burgers that bounce all over the screen, but even with that simple task, it's horribly addictive. Of course, Shashank knows this. On his Web site ([www.shashankhrgames.com](http://www.shashankhrgames.com)), you will find this cautionary note: "Careful while playing my games, they are addictive."

The next game was *Man and Monster*—a three-level adventure, which was the first step to his latest—*Go Tomatoes!*, and last month, he finished *Go Tomatoes!*, a game he'd been working on for the past couple of months.

So why does he keep making these games? "I just do it as a hobby. It's really fun, you know," he says. And his intentions are quite noble too—he does it for a greater good: "I almost never play my games" he says, "but my friends enjoy them."

## The Game

Remember the classic platform games like *Dangerous Dave*? Well, that was the first thing we thought of when we played *Go Tomatoes!* for the first time. It's a simple 2D game, where you

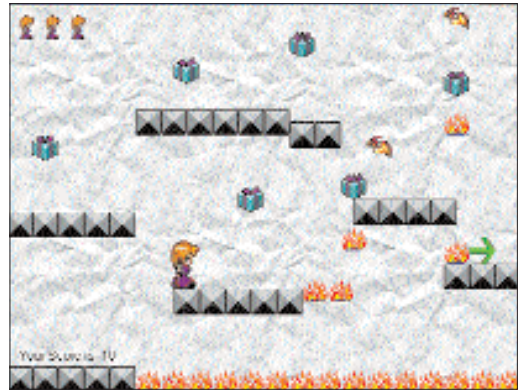


The one that started it all—*Burger in The Oven*



"I almost never play my games, but my friends enjoy them"

**Shashank H R**  
Student  
Bangalore



Man and Monster—something's brewing here



And presenting... *Go Tomatoes!*

go around the room collecting tomatoes. And here's an interesting element of realism: ripe tomatoes are the best, giving you a juicy score, the overripe ones are worth a little less, and the rotten tomatoes are the worst—not only do they subtract from your score, they also cost you your health, eventually causing you to die if you eat too many.

There are six levels of tomato-munching fun, and our only complaint with the game is that it's too short!

## What Next?

Even as you read this, Shashank has started learning how to create his own 3D game—something we're all waiting eagerly for. So if you've created 3D games of your own and have some useful advice for him, pop over to his Web site and contact him.

Ask him if he wants to become a serious game developer when he grows up, and he mulls, "It's still too early to decide. I like doing this, but it's just a hobby right now". For the good of Indian game development, we sure hope he doesn't stop liking it in the years to come.

Well, we've had our unofficial "Youngest Reader" competitions, and now Shashank has kicked off the "Youngest Doer-of-something-cool-and-geeky" competition. So if you know someone whose techie activity deserves a mention in *Digit*, drop us a line—the younger the better! ■

[nimish\\_chandiramani@thinkdigit.com](mailto:nimish_chandiramani@thinkdigit.com)

## Game Maker

Game Maker ([www.gamemaker.nl](http://www.gamemaker.nl)) is a free game creation tool that doesn't need you to have any programming knowledge—just enough creativity to figure out what your game should be. It's excellent for 2D games like clones of our favourites—Mario, PacMan, Arkanoid, you name it. You can add backgrounds, sound effects, animations, background music, and loads more with the free version. It lets you create your own 3D games as well! It comes packed with a bunch of free images and animations, so you don't even need

to make the graphics for your first game. Once you've created a game, you own all the rights to it, so do with it as you will—distribute it among your friends, or send it to us; if it's good, we'll even put it on our CD!

You can find plenty of game tutorials on Game Maker's Web site, as well as games that were created using Game Maker.

We've included Game Maker on this month's CD, and to learn how to create your first *Arkanoid* clone in thirty minutes, turn to page xx in this issue.

# Sounds Good!

Music that fits into your pocket without burning holes

Anup Nair and Kailas Shastry

**M**P3 players mark a revolutionary stage in the evolution of personal entertainment devices. From the heavenly Apple iPod to their earthly cousins, there is a problem of plenty. It seems as if every manufacturer on earth is making an MP3 player, leaving even informed consumers confused and uncertain. Mediation is at hand though—through these pages we take to task 49 portable music players, and help you pick the best for your needs. Interestingly, all these players can act as regular USB thumb drives to carry your data around. Business with pleasure? You bet!

## Our Classification

After some deliberation, we decided to broadly classify the players based on the storage medium—Flash memory and hard drive. Flash-based personal storage media are relatively less expensive, and can easily hold 1GB of data today—the iPod nano packs in 4 GB of Flash storage! Hard disk-based players have higher storage capacities, and are more expensive.



## FLASH-BASED PLAYERS

Let's start off with Flash-based players. We received a total of 43 products in this category. Clearly, small is in.

## A Look At Features

Barring the Sony Network Walkman (NW) series, all the players we tested are capable of playing MP3 and WMA files. These music files can be just copied onto the player from a PC, without the need for any software. Nearly all the players support a bitrate of up to 340 kbps—

Imaging Rohit Chandwaskar  
Photograph Jiten Gandhi

more than sufficient for near-CD-quality MP3s ripped from audio CDs. In fact, it's more than likely that you would choose a lower bitrate in order to fit more songs into the available space.

Some players offer support for the Ogg Vorbis (.ogg) and ASF formats as well. Ogg Vorbis is an open source audio encoding technique that offers the same quality as MP3 compression, at lower file sizes.

Playing WMAs eats through the battery life faster than when you play MP3s, because of the more complex computations needed to decode WMA. The difference can be as much as 25 per cent!

Sony's NW series need bundled software called SonicStage to synchronise the player with a PC. The software converts the music files on the computer to a proprietary format before transferring them to the player. The conversion and transfer is a slow process, and takes up CPU resources as well.

FM reception and recording is now more of a norm than an exception. But when we tested them, not all the players were able to pick up weak radio signals. If you're taking a morning walk, FM reception on your player shouldn't be a problem, but some of these players might act up if you try to tune in to your favourite station indoors or in a bus.

Most—but not all—players allow you to record FM broadcasts. Some

video are provided in some mid-range players (videos have to be converted to certain formats before they can be played). The tiny screens do little justice to movies, though.

The YES YMP models—the 920, 921, 922 and 928—can play video, while the SAFA 800 series offer JPEG viewing. The YES 922 takes the feature list beyond music and video capabilities with a TV remote control feature. Now, just what else can you pack into an MP3 player?

### Evaluating Sound Quality

If 10 people are each given 10 music players to choose the best from, you'll possibly have five different best players. What sounds good to someone may sound average to others. You might prefer to turn off the equaliser, and your friend finds bliss only when the bass is blasting away. In our tests, though, we kept the equalisers off, so as to reduce this subjective element.

Cutting across brands, we found one common characteristic amongst entry-level and mid-range players—nearly all of them reproduced bass with acceptable quality. The same does not go for the treble, however. This means that while your 160 beats-per-minute trance tracks will sound fine, classical music will not seem quite as rich as you'd like. This is probably a balancing act by the manufacturers—most music today



might produce a noticeable hiss during recording, but the recorded files will be free of noise.

Recording is mostly done in the .WAV format, which is less demanding on the encoding logic circuitry and easy on power consumption. But WAV occupies more space. Mid-range and high-end players usually offer MP3 recording at a bitrate of 64 to 360 kbps. Some players also feature direct line-in recording, turning the MP3 player into an all-in-one mobile recording device.

Some players go beyond sound and offer video on the move. Native support for JPEG and

is bass-heavy, at least the kind of songs that the 18-25-year-old target consumer presumably listens to. If fast-paced, bass-heavy music is what you like, the MuVo series from Creative or the XFL series from XFREE fits your bill, with not too much of a trade-off on treble. At high volumes, though—which, by the way, we don't recommend, for the sake of your ears—some jarring does occur.

An exception to this was the Samsung YP C1, which, while doing a neat job with the treble, simply ate away the bass, taking away the kick

## Digital Passion | MP3 Player Test

from dance tracks. Its cousin, the YP F1, balanced the bass and treble a lot better.

To state the obvious about the iPod nano, it's good to have one if you can afford it. As for the best of the rest, while they may not have the flaunt value the iPod has, they offer excellent sound quality and come with the usual works—FM, recording capability, and so on. The Transcend T.sonic 610, the D1, Z5 and F1 from Samsung, YMP 920, Sony NW E307, and the SAFA Q100 find a place in the Best of the Rest list.

We expected more from the Sony Network Walkman (NW) series. The NW E105, especially, could have done better in the bass department. The 1 GB E307 comes for Rs 10,490, while the T.Sonic 610, which sounds just as good, if not better, costs just a little over half that price—Rs 5,500 for the same memory. Sony seems to have banked on their image a little too much!

All the players in the Creative MuVo family are similar, even on the battery life front. The design and look of the XFREE XFL series seems a straight lift from the MuVos—to the extent where we wondered if Creative and the XFREE were the same! The XFREE players, however, are a notch below the MuVo players when it comes to sound clarity.

In most players, the bottleneck for good sound quality

lies with the bundled earphones. This was plainly evident with the XFREE players—merely changing the earphones improved the sound quality by an appreciable amount. The Bravish M 339 was another player that can produce good sound, but the earphones played spoilsport. While not every set of earphones is compatible with every player, sometimes using one from a higher model can actually bridge the gap between mere sound and blissful music!

### A Look At Looks

Beauty is skin deep. Well, maybe. But we *are* interested in the skin here!

Just how differently can you design a box? Some have curved edges while some are protruding, some have a graceful single colour while other have jazzy combinations; stickers, too, are generously used to add character to the products.

Samsung's YP F1, on first sight, resembles a small flip-open phone, but looks good nevertheless. Love-it-or-hate-it is what Sony E307's bean shape is all about. Transcend's T.sonic 610 is sleek, light and elegant in its own right, though not bold or colourful in design.

The two mobiBLU models we received left

**BEST BUY**  
**digit**  
MAY 2006



### How We Tested

We aimed to make our test process as realistic as possible, so real-world tests dominated our test pattern.

All the hard drive-based MP3 players were interfaced to a PC running on an AMD Athlon XP 2400+ for the battery charging and data transfer tests. The system was built around the NVIDIA

nForce 2 chipset with the latest nForce drivers, 512 MB of Hynix DDR 333 MHz SDRAM, a Seagate Barracuda 80 GB hard disk, on-board sound, and a GeForce 5200FX AGP Card. All the Flash-based players were tested on an Intel Pentium 4 HT 3.2 GHz with

1 GB of DDR533 RAM and a MAXTOR 120 GB SATA I hard drive. Both the machines ran Windows XP with Service Pack 2 to enable full support for USB 2.0 from the OS side.

Both our test categories went through the same test process, except that we used different machines for the data transfer tests. The test process is broadly classified into five main sections: Features, Accessories, Ergonomics and Ease of Use, Performance, and Price Index.

Under Features, we noted supported audio formats, FM, direct Line-in encoding, display type, number of colours in the display, etc. Some players had extra features such as video and photo support, which were given extra points.

Scores were also given to the available accessories. These scores, however, do not affect our overall score in a big way, as the weight given to this section is the lowest amongst the five. This section mainly features as information on the package contents.

Factors such as button placement and portability matter a lot. Do spend time looking at these before buying. We took both

the physical (button) interface as well as the software interface of the player into account here.

Features and Performance were given equal consideration, because as a buyer, one would like to buy a good-quality player that is feature-rich at the same time. We carried out a thorough test to check the players' audio output quality. We chose bass-centric tracks (such as *Smack my b\*\*ch up* by Prodigy) and a few tracks that were reliant on treble (such as music by Joe Satriani and Steve Vai). Trance music has a blend of bass, treble and electronics such as effects of synthesizers and disc scratch, making for a complete sound package. Vocal tracks such as *Maan Ki Lagan* from *Paap* and *Punjab* by *Karunesh* helped us judge overall playback quality for more mellow tracks. It also helped in judging whether bass and treble were overshadowing each other, and if the result subdued the vocals.

Usable storage capacity was also noted. We've deliberately not awarded points for capacity in the Features segment—the effect of capacity will automatically reflect in the Price Index, which is the ratio of the cost of a player to its actual capacity. This gives us an idea of the amount a buyer will have to pay per MB (Flash-based) or GB (HDD-based). What you pay for the *features* comes under the Features department.

Files amounting to 100 MB (Flash-based) and 1 GB (HDD-based) were used to determine data transfer rate. A battery drain test was conducted by keeping a player at 65 per cent volume and looping tracks non-stop, until playback stopped. The start time and end time were noted to give the battery life of the player. Out-of-the-pack Duracell alkaline AA and AAA batteries were used for the players that needed them. Both these tests fall under the Performance segment.

lasting impressions on everyone who chanced to see it, including the been-there-seen-that veterans. The DAH 220 is a cassette-shaped player whose semblance to the cassette tapes of yore does not end with looks. It can be inserted into a cassette player to play the stored MP3s! (There is a magnetic head that converts the digital data to analogue signals, which get processed by the music system.) While the design is intriguing, the overall build quality could have been better.

The other mobiBLU model, the DAH 1500i, is a *cube*—a perfect 24 mm cube—and claims to be the world's smallest MP3 player. With its unassuming form factor, it is easy to mistake it for a colourful die or a small paperweight, and difficult to fathom the fact that it can hold 1GB of data. Well done, mobiBLU!

Build quality is something many players in the entry segment can improve on. Barring the Megaplayer 515 and 520, the other MSI players leave a lot to be desired—surely not something you would like to gift someone. The same goes for the Genuis DJ 520, UMAX Vega 107, and the Orite Rock DJ. Sony, too, was an unpleasant surprise, with the E105 and E307 simply not feeling good enough in the hands. The saving grace for Sony here was its E503.

Of particular mention are the Samsung YP and the Creative Muvo series, which are above average when it comes to build quality and finish.

## Earphone Comfort

There is little point in having long battery life or ample storage room if your earphones cause irritation or even pain. Earphone comfort must be considered an important factor while choosing a player. In this area, the MSI Megaplayer series scored low: the earphones were actually painful when in the ears. The Megastick (256 MB) was a welcome change with its clip-on earphones—very comfortable. The XFREE, Transcend and SAFA earphones were easy on the ear, and listening to music continuously for an hour or two wasn't uncomfortable.

The earphone comfort/discomfort factor may not be the same for every person. It is therefore wise to personally check out the earphones before buying a player, or consider using earphones other than what's been supplied with the player.



mobiBLU DAH-220

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Scoreboard		Flash-Based MP3 Players					
BRAND	Apple	Bravish	COWON	Creative	Creative	Creative	Creative
MODEL	iPod Nano	M 339	iAUDIO U2	MuVo N200	MuVo N200	MuVo TX FM	MuVo TX FM
Features (40%)	21.88	20.2	29.88	27.4	27.4	25.8	25.8
Capacity	4 GB	256 MB	256 MB	256 MB	512 MB	256 MB	512 MB
Battery Type/Rechargeable (Y/N)	Li-Ion/✓	AAA/✗	Li-ion/✓	AAA/✗	AAA/✗	AAA/✗	AAA/✗
Display Type (OLED/LCD)/Colours	LCD / 64K	LCD / Mono	LCD / Mono	LCD / Mono	LCD / Mono	LCD / Mono	LCD / Mono
Remote Control (Y/N)	✗	✗	✗	✗	✗	✗	✗
PC Interface	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0
Audio Formats Supported	AAC, MP3, Audible, Apple Lossless, AIFF	MP3, WMA, ASF	MP3, MP2, WMA, ASF, OGG	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA
Firmware Upgrade Available (Y/N)	✓	✓	✓	✓	✓	✓	✓
Voice Recording/Line-in Encoding	✗/✗	✓/✗	✓/✓	✓/✓	✓/✓	✓/✗	✓/✗
FM Tuner/Recording (Y/N)	✗/✗	✓/✗	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
Inbuilt Speakers	✗	✗	✗	✗	✗	✗	✗
Power Saving Mode (Y/N)	✗	✓	✓	✓	✓	✓	✓
Presets/Customisable Equaliser Modes (Excluding "Normal")	22/✗	4/✓	5/✓	4/✓	4/✓	4/✓	4/✓
Trackmarking A-B Repeat	✗	✓	✓	✓	✓	✓	✓
<b>Playback Features</b>							
Custom Playlist/Track Repeat/Shuffle Tracks	✓/✓/✓	✗/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓
Folder Support (Y/N)	✗	✗	✓	✓	✓	✓	✓
Miscellaneous Features	Volume Limiter, Calendar+To-Do, Contacts, Games, Notes, and Stopwatch	Customisable backlight colour	SRS WOW, 3D Surround	Reversible display for right/left handed	Reversible display for right/left handed	Reversible display for right/left handed	Reversible display for right/left handed
Accessories (5%)	3.65	2.75	3.65	1.65	1.65	1.65	1.65
Bundled Software	Software CD including iTunes	Driver CD	Software CD	Software CD	Software CD	Software CD	Software CD
Other Accessories	USB Cable, ear-bud ear-phones	None	USB cable, line-in cable, carry case, neck cord	Earphone belt-clip, arm-band, USB cable	Beltclip, arm-band, USB cable	Beltclip, arm-band	Beltclip, arm-band
Separate Power Adaptor (Y/N)	✗	✗	✗	✗	✗	✗	✗
Ergonomics And Ease of Use (10%)	6.67	6.68	6.61	6.24	6.24	6.07	6.07
Dimensions (Inches) (W x H x D)	3.5 x 1.6 x 0.27	3.14 x 1.18 x 0.82	0.98 x 2.91 x 0.71	2.58 x 1.32 x 0.51	2.58 x 1.32 x 0.51	2.9 x 1.4 x 0.6	2.9 x 1.4 x 0.6
Weight (grams)	42.7	25	34	22	22	32	32
Intuitive Button Placement (So5)	3.75	4.25	4	3.5	3.5	3.5	3.5
Interface/Menu Navigation (So5)	4	4	3.75	2.75	2.75	2.75	2.75
Earphone Comfort Factor (So5)	4	3.5	3.75	3.5	3.5	3.5	3.5
Portability (So5)	4	3.5	3.75	3.75	3.75	3.75	3.75
Build Quality (So5)	3.5	3.5	3.75	3.75	3.75	4	4
Performance (35%)	24.09	18.90	20.77	21.02	21.10	20.98	21.04
<b>Audio Quality (So5)</b>							
Bass/Treble/Electronics	4.25/4.25/4.25	4/3.75/3.75	3.25/3.5/5.5	4/3.5/3.5	4/3.5/3.5	4/3.5/3.5	4/3.5/3.5
Vocals/FM Playback	4.25	3.5/4	3.5/4	3.5/4	3.5/4	3.5/4	3.5/4
100 MB Data Transfer (Time In Seconds)	15	140	60	57	53	60	56
Battery Life (hours)	14	9	18	16	16	16	16
Usable Capacity (MB)	3789	241	240	242	495	242	495
Price (Rs)	15,900	2,750	5,500	5,499	7,199	4,999	6,999
Overall Score	64.29	51.47	62.38	57.79	58.70	56.12	56.94



+ Easy navigation, amazing audio quality  
- No FM



+ Good sound quality  
- Average earphones



+ Many formats supported  
- Average earphones



+ Good sound quality  
- Rocker button is a let down



+ Good sound quality  
- Rocker button is a let down



+ Good sound quality  
- Rocker button is a let-down



+ Good sound quality  
- Rocker button is a let down

**Note 1:** AVLS = Automatic Volume Limiter System

**Note 2:** A price index is calculated from price and storage capacity. This makes up 10% of the Overall Score



Creative MuVo V200	Creative MuVo Slim	Genius MP3 DJ - 520	mobiBLU DAH-1500i	mobiBLU DAH-220	MSI 533	MSI MEGA 515	MSI MEGA Player 533
25.8	23.88	25.88	27.8	24.52	18.16	24.6	20.4
1 GB	256 MB	256 MB	1 GB	256 MB, MMC	MMC / SD	256 MB	256 MB
AAA/*	Li-ion/✓	Li-ion/✓	Li-ion/✓	NiMH/✓	AAA/*	Li-ion/✓	AAA/*
LCD / Mono	LCD / Mono	LCD / Mono	OLED / Multi	NA	LCD / Mono	OLED / Multi	LCD / Mono
✗	✗	✗	✗	✗	✗	✗	✗
USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 1.1	USB 2.0	USB 2.0	USB 2.0
MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA
✓	✓	✓	✓	✓	✓	✓	✓
✓/✗	✓/✗	✓/✗	✓/✗	✓/✓	✗/✗	✓/✗	✓/✗
✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✗	✓/✗	✓/✓
✗	✗	✗	✗	✗	✗	✗	✗
✓	✗	✓	✓	✓	✓	✓	✓
4/✓	5/✓	6/✗	4/✓	4/✗	4/✗	4/✗	4/✗
✓	✓	✓	✓	✓	✗	✓	✗
✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓
✓	✓	✓	✓	✓	✓	✓	✓
Reversible display for right/left handed	None	Two headphone jacks, auto fade-out	SRS WOW	Playable on cassette players	Reads MMC/SD Cards	None	Reads MMC/SD Cards
1.65	3.65	3.875	3.65	4.55	3.2	3.65	3.425
Software CD	Creative Media Source	Driver CD	Driver CD	Software CD	Driver CD	Driver CD	Driver CD
Beltclip, arm-band	USB cable, carry pouch	Two pairs of earphones, USB cable	Protective case, USB cable, necklace earphones	USB cable, spare battery, carry case, encoding cable, external charger	USB cable	USB cable	USB cable
✗	✗	✗	✗	✓	✗	✗	✗
5.85	4.76	6.27	7.00	4.23	5.52	6.26	5.68
1.43 x 2.93 x 1.3	2.1 x 3.3 x 0.3	2.55 x 1.37 x 0.6	0.95 x 0.95 x 0.95	3.15 x 1.58 x 0.7	2.28 x 1.9 x 0.53	2.38 x 1.95 x 0.63	2.28 x 1.9 x 0.53
33	34	30	18	35	29	48	29
3.5	3	3.5	4	4	3.5	4	3.5
2.75	2.5	3.5	3	2.5	2.75	4	3.25
3.5	2.75	3.75	3.25	3	2.5	3.25	2.5
3.75	2.25	3.75	4.5	2.5	3.75	3.5	3.75
3.5	2.75	3.25	4	3	3	3.5	3
21.01	20.12	17.51	16.04	16.88	28.57	17.62	17.205
4/3.5/3.5	2.75/2.75/2.75	3.5/3.25/3.25	3/3/2.75	3.75/3.5/3.25	3.5/3.5/3.25	3.5/3.5/3.25	3.5/3.5/3.25
3.5/4	3/3.75	3.25/4	3/3.	3.5/3.5	3.5/3.75	3.5/4	3.5/3.75
58	175	131	53	581	300	161	180
16	175	10	9	7	8	9	8
993	243	232	992	246	128	244	240
8,999	5,499	3,200	7,400	4,800	1,700	3,500	2,700
58.02	53.90	55.97	58.99	51.90	57.98	54.47	49.69



+ Good sound quality  
- Rocker button is a let down



+ Good sound quality  
- Slim, but too large



+ Good VFM, twin earphones  
- Average sound quality



+ Good display, unique design  
- Average sound quality



+ Playable in cassette players  
- Difficult navigation, average build quality



+ Low cost, SD card reader  
- Average sound quality



+ Good display  
- Recording interface not intuitive



+ Low cost, SD card reader  
- Poor build quality

Scoreboard		Flash-Based MP3 Players				
BRAND	MSI	MSI	MSI	MSI	NU	Orite
MODEL	MEGA Player 541	MEGASTICK 520	MEGASTICK 528	MEGASTICK 256	Dark Shadow	Rock DJ
Features (40%)	29.4	23.8	26.2	24.6	8.96	6.8
Capacity	512 MB	256 MB	512 MB	256 MB	256 MB	SD / MMC
Battery Type/Rechargeable (Y/N)	Li-ion/✓	AAA/✗	Flash/✗	AAA/✗	Li-ion/✓	AAA/✗
Display Type (OLED/LCD)/Colours	OLED / multi	LCD / Mono	LCD / Mono	LCD / Mono	NA	NA
Remote Control (Y/N)	✗	✗	✓	✗	✗	✗
PC Interface	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 1.1
Audio Formats Supported	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA, ADPCM	MP3, WMA
Firmware Upgrade Available (Y/N)	✓	✓	✓	✓	✓	✗
Voice Recording/Line-in Encoding	✓/✓	✓/✗	✓/✓	✓/✓	✓/✗	✓/✗
FM Tuner/Recording (Y/N)	✓/✓	✓/✓	✓/✓	✓/✓	✗/✗	✗/✗
Inbuilt Speakers	✗	✓	✗	✗	✗	✗
Power Saving Mode (Y/N)	✓	✓	✓	✓	✗	✓
Presets/Customisable Equaliser Modes (excluding "Normal")	4/✓	4/✗	4/✗	4/✗	NA	3/✗
Trackmarking A-B repeat	✓	✓	✓	✓	✗	✗
<b>Playback Features</b>						
Custom Playlist/Track Repeat/Shuffle Tracks	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✗/✗/✗	✗/✗/✗
Folder Support (Y/N)	✓	✓	✓	✓	✗	✗
Miscellaneous Features	Dual earphone jack	LED flashlight	Customisable backlight colour	None	Polarised shades	None
Accessories (5%)	3.65	3.1	3.65	3.65	3.65	1.65
Bundled Software	Driver CD	Driver CD	Driver CD	Driver CD	Driver CD	Software CD
Other Accessories	USB cable	USB cable	USB cable	USB cable	Extra shades, USB cable	USB cable
Separate Power Adaptor (Y/N)	✗	✗	✗	✗	✗	✗
<b>Ergonomics And Ease of Use (10%)</b>	<b>6.28</b>	<b>6.47</b>	<b>5.87</b>	<b>6.34</b>	<b>5.15</b>	<b>4.84</b>
Dimensions (Inches) (W x H x D)	2.56 x 1.18 x 0.53	0.4 x 1.4 x 0.53	1.18 x 3.62 x 0.76	3.76 X 1.22 x 0.74	1.6 x 6.6 x 0.64	3.58 x 1.4 x 0.87
Weight (grams)	40	29	32	29	50	33
Intuitive Button Placement (So5)	4	3.5	3.5	3.75	3	3
Interface/Menu Navigation (So5)	3.75	3	3.25	3	NA	2
Earphone Comfort Factor (So5)	3.5	2.75	3.5	4.5	3.25	3
Portability (So5)	4	3.5	3.75	3.5	3.5	3.25
Build Quality (So5)	2.75	3.5	2.75	3.5	3	2.5
<b>Performance (35%)</b>	<b>17.30</b>	<b>17.62</b>	<b>16.16</b>	<b>18.13</b>	<b>15.03</b>	<b>13.38</b>
<b>Audio Quality (So5)</b>						
Bass/Treble/Electronics	3.5/3.75/3.25	3.5/3/2.75	3/3/2.75	3.25/4/3.75	3/3.25/3.25	2.25/2.75/2.75
Vocals/FM Playback	3.5/3.25	3/3.5	3.25/3.5	4/3.5	3.25	3
100 MB Data Transfer (Time In Seconds)	171	61	60	165	120	300
<b>Battery Life (hours)</b>	<b>8</b>	<b>12.5</b>	<b>8.5</b>	<b>7.5</b>	<b>8</b>	<b>10</b>
Usable Capacity (MB)	487	244	492	241	245	128
<b>Price (Rs)</b>	<b>6,000</b>	<b>3,500</b>	<b>4,500</b>	<b>2,500</b>	<b>4,950</b>	<b>2,750</b>
<b>Overall Score</b>	<b>59.37</b>	<b>51.53</b>	<b>55.56</b>	<b>55.96</b>	<b>34.46</b>	<b>28.23</b>



+ Good display  
- Buttons hard to operate, poor build quality



+ LED torch  
- Poor build quality



+ Choice of back-light colours  
- Menu navigation not intuitive



+ Low cost, dedicated FM button  
- Poor build quality, narrow viewing angle



+ Style with functionality  
- No FM, no forward/rewind



+ None in particular  
- Expensive

**Note 1:** AVLS = Automatic Volume Limiter System

**Note 2:** A price index is calculated from price and storage capacity. This makes up 10% of the Overall Score

SAFA SR-M820F	SAFA SF-Q100	SAFA SR-M850F	Samsung YP-D1	Samsung YP-Z5	Samsung YP-C1	Samsung YP-F1	Sony NW-E105
30.64	32.32	27.84	34.24	16.6	25.16	25.2	14.96
256 MB	1 GB	512 MB	1 GB	2 GB	1 GB	512 MB	512 MB
Li-ion/✓	Li-ion/✓	Li-ion/✓	Li-ion/✓	Li-ion/✓	AA/✗	Li-ion/✓	AA/✗
LCD / 64K	OLED / 64K	LCD / 64K	LCD / 262K	LCD / 64K	LED / Mono	LCD	LCD / Mono
✗	✗	✗	✗	✗	✗	✗	✗
USB 1.1	USB 2.0	USB 1.1	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0
MP3, WMA, OGG	MP3, WMA, ASF	MP3, WMA, OGG	MP3, Ogg Vorbis, WMA, WAV	MP3, WMA, WMA-DRM	MP3, WMA, ASF, OGG	OGG, MP3, WMA	ATRAC, MP3
✓	✓	✓	✓	✓	✓	✓	✓
✓/✓	✓/✓	✓/✗	✓/✓	✗/✗	✗/✓	✗/✗	✗/✗
✓/✓	✓/✓	✓/✓	✓/✓	✗/✗	✓/✓	✓/✓	✗/✗
✓	✓	✓	✓	✗	✗	✗	✗
✓	✓	✓	✓	✗	✓	✓	✓
5/✓	6/✓	6/✓	7/✓	12/✗	7/✓	6/✓	2/✗
✓	✓	✓	✓	✗	✓	✓	✓
✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✗	✓/✓/✓	✓/✓/✓	✓/✓/✓
✓	✓	✓	✓	✓	✓	✓	✗
Address book, stereo speakers	Stereo speakers	Address book, stereo speakers	2-megapixel camera, Photo mode, Video mode, can act as a USB host	Tap-pad used instead of touchpad	None	None	AVLS
4.1	3.65	4.55	4.32	3.65	3.65	3.875	3.2
Software CD	Software CD	Software CD	Installation CD	Easy-start CD	Installation CD	Installation CD	Sony SonicStage
Audio line-in cable, USB cable, wrist strap, neck strap, keychain	USB cable, carry pouch	Audio line-in cable, USB cable, wrist strap, neck strap, keychain	USB cable, USB on-the-go, line-in cable	USB cable	USB cable, carry pouch	USB cable, three face plates, necklace ear-phones	USB cable
✗	✗	✗	✗	✗	✗	✗	✗
6.16	6.57	6.17	6.16	5.88	6.33	6.33	5.64
1.61 x 3 x 0.67	1.31 x 2.62 x 0.58	1.61 x 3 x 0.67	3.3 x 1.77 x 0.7	3.54 x 1.66 x 0.45	1.02 x 2.8 x 1.02	1.75 x 3.27 x 0.61	2.2 x 2.2 x 0.75
53.5	30.5	53.5	64	45.3	26	55	26
4.25	4.25	4.25	3.75	3.5	3.5	4	3.5
3.5	3.5	3.5	4	3	3.75	3	3
3.75	3.75	3.75	3.25	3.5	4	3.5	3.5
3.25	3.75	3.25	3.5	3.5	3.25	4	3.25
3.5	3.5	3.5	3.75	3.75	4	4.5	2.5
19.84	22.91	19.73	21.21	20.53	23.23	19.88	23.54
4/3.5/3.25	4.5/4/4	4/3.5/3.25	3.5/3.5/3.75	3.25/3.5/3.5	3/3.75/3.75	4/4/3.75	3.5/3.25/4
3.5/4	4/4	3.5/4	3.5/4	3.5	3.75/3.5	3.75/3.5	3.25/3.25
190	45	166	15	52	51	59	240
15	15	14.5	8.5	21.5	25	9.5	30
240	980	490	977	1946	992	494	486
6,150	8,600	7,100	21,500	11,500	5,790	6,390	6,990
62.05	69.28	60.61	67.46	52.35	64.13	57.88	49.68



+ Good interface, inbuilt speakers  
- Low data transfer speed



+ Good sound and interface  
- Screen too small for video



+ Good interface, inbuilt speakers  
- Low data transfer speed



+ 2-megapixel camera  
- Expensive



+ Good build quality and interface  
- Navigation not easy



+ Good build quality, value for money  
- Bass not rendered well



+ Good build quality  
- Low battery life



+ Good battery life  
- Needs SonicStage to transfer songs

Scoreboard		Flash-Based MP3 Players				
BRAND	Sony	Sony	Transcend	Transcend	UMAX	XFREE
MODEL	NW-E307	NW-E503	T.Sonic 310	T.Sonic 610	Vega 107	XFL-200
Features (40%)	22.4	21.2	11.52	27.88	22.6	25
Capacity	1 GB	256 MB	512 MB	1 GB	128 MB	512 MB
Battery Type/Rechargeable (Y/N)	Li-ion/✓	Li-ion/✓	Li-ion/✓	Li-ion/✓	AAA/*	AAA/*
Display Type (OLED/LCD)/Colours	OLED / Multi	LCD / Mono	NA	OLED / Multi	LCD / Mono	LCD / Mono
Remote Control (Y/N)	✗	✗	✗	✗	✗	✗
PC Interface	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 1.1	USB 2.0
Audio Formats Supported	ATRAC, MP3	ATRAC, MP3	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA
Firmware Upgrade Available (Y/N)	✓	✓	✓	✓	✓	✓
Voice Recording/Line-in Encoding	✗/✗	✗/✗	✗/✗	✓/✗	✓/✓	✓/✗
FM Tuner/Recording (Y/N)	✓/✗	✓/✗	✗/✗	✓/✓	✓/✓	✓/✓
Built-In Speakers	✗	✗	✗	✗	✗	✗
Power Saving Mode (Y/N)	✓	✓	✗	✓	✓	✓
Presets/Customisable Equaliser Modes (excluding "Normal")	2/✓	2/✓	NA/✓	6/✓	6/✗	4/✓
Trackmarking A-B repeat	✓	✓	✗	✓	✓	✓
<b>Playback Features</b>						
Custom Playlist/Track Repeat/Shuffle Tracks	✓/✓/✓	✓/✓/✓	✗/✓/✓	✓/✓/✓	✗/✓/✓	✓/✓/✓
Folder Support (Y/N)	✗	✗	✓	✓	✓	✓
Miscellaneous Features	AVLS	AVLS	USB lock for PC	None	None	None
Accessories (5%)	3.2	3.2	3.2	3.65	3.65	3.2
Bundled Software	Sony SonicStage	Sony SonicStage	Software CD	Software CD	Driver CD	NA
Accessories	USB cable	USB cable, belt clip	Neck strap	Carry pouch, neck strap, wrist strap	USB cable, neck strap	USB cable
Separate Power Adaptor (Y/N)	✗	✗	✗	✗	✗	✗
Ergonomics & Ease of Use (10%)	5.26	6.00	6.26	6.77	6.02	6.02
Dimensions (Inches) (W x H x D)	2.7 x .9 x 1.5	1.14 x 3.34 x 0.64	3.36 x 1 x 0.5	2.76 x 1.4 x 0.6	NA	1.4 x 2.6 x 0.5
Weight (gms)	50	47	29	28	NA	33
Intuitive Button Placement (So5)	3.5	3.75	3.75	4.25	4	3.25
Interface/Menu Navigation (So5)	3	3.5	NA	3.75	3.5	2.75
Earphone Comfort Factor (So5)	3.5	3	3.75	4.25	3.5	4
Portability (So5)	3.25	3.25	4	3.25	3.5	3.75
Build Quality (So5)	2.5	4	3.25	3.75	2.75	3.5
Performance (35%)	23.902	22.089	17.025	20.16	18.38	15.42
<b>Audio Quality (So5)</b>						
Bass/Treble/Electronics	4/3.5/4	4/3.5/3	2/3.5/3.25	4.25/3.5/3.5	3.75/3.5/3.25	3.25/3/2.75
Vocals/FM Playback	3.5/3.5	3	3.5/	3.5	3.5	3/3.25
100 MB Data Transfer (Time In Seconds)	150	225	49	56	174	150
Battery Life (hours)	27	26	14.5	13	12	8
Usable Capacity (MB)	974	243	495	992	119	494
Price (Rs)	10,490	7,990	3,640	5,500	4,500	4,500
Overall Score	57.88	53.51	42.57	64.52	51.54	53.33

					
<ul style="list-style-type: none"> <li>+ Good battery life</li> <li>- Needs SonicStage to transfer songs</li> </ul>	<ul style="list-style-type: none"> <li>+ Good battery life</li> <li>- Needs SonicStage to transfer songs</li> </ul>	<ul style="list-style-type: none"> <li>+ Touch sensor operation</li> <li>- Poor sound quality</li> </ul>	<ul style="list-style-type: none"> <li>+ Sleek design, good sound quality</li> <li>- None in particular</li> </ul>	<ul style="list-style-type: none"> <li>+ Easy to navigate</li> <li>- Average build quality, low value for money</li> </ul>	<ul style="list-style-type: none"> <li>+ Compact</li> <li>- Sub-par earphones</li> </ul>

**Note 1:** AVLS = Automatic Volume Limiter System

**Note 2:** A price index is calculated from price and storage capacity. This makes up 10% of the Overall Score

XFREE	XFREE	YES	YES	YES	YES	YES	YES
XFL-200	XFL-260	YMP-901	YMP-920	YMP-921	YMP-922	YMP 928	YMP-9
25	25	28.68	30.32	30.48	33.12	31.56	25.08
256 MB	256 MB	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB
AAA/*	AAA/*	Li-ion/✓	Li-ion/✓	Li-ion/✓	Li-ion/✓	Li-ion/✓	AAA/*
LCD / Mono	LCD / Mono	LCD / Mono	LCD / 65K	LCD / 262K	LCD / 64K	LCD / 64K	Dot matrix LCD / Mono
*	*	*	*	*	✓	*	*
USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0
MP3, WMA	MP3, WMA	MP3, WMA, ASF	MP3, WMA, WAV, OGG	MP3, WMA, ASF, VBR, OGG	MPEG 1/2/2.5 Layer 3, WMA, ASF, OGG, MPEG4	MP3, WMA, OGG, JPEG, MPEG-4	MP3, WMA
✓	✓	✓	✓	✓	✓	✓	✓
✓/*	✓/*	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	*/✓
✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
*	*	*	*	*	✓	✓	*
✓	✓	✓	✓	✓	✓	✓	✓
4/✓	4/✓	10/✓	10/✓	5/✓	6/✓	7/✓	4/✓
✓	✓	✓	✓	*	*	*	✓
✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓
None	None	None	None	None	TV remote	Pivot rotating screen	None
3.2	3.2	3.87	3.87	3.2	3.2	3.2	3.2
NA	Installation CD	Installation CD	Installation CD	Installation CD	Installation CD	Installation CD	Driver CD
USB cable	USB cable	Neck strap, Carry pouch, USB cable, line-in cable	Line-in cable, USB cable, neck strap	USB cable	USB cable	USB cable	USB cable
*	*	*	*	*	*	*	*
6.02	6.24	6.41	6.42	6.51	6.17	4.44	5.42
1.4 x 2.6 x 0.5	2.58 x 1.4 x 0.5	2.22 x 1.17 x 0.72	2.28 x 1.1 x 0.86	NA	1.2 x 2.7 x 0.69	2.6 x 1.5 x 0.72	NA
33	22	40	40	NA	40	56	NA
3.25	3.25	4	3.5	3.5	3.5	3.25	3.5
2.75	2.75	3.75	4	4	3.75	2.75	2.75
4	4	3.5	3.5	3.5	3.5	3.5	3
3.75	3.75	3.5	3.75	3.75	3.5	3.25	3.75
3.5	3.5	3.75	3.75	4	3.5		2.5
15.47	15.44	20.45	24.67	21.51	21.75	22.55	14.04
3.25/3/2.75	3.25/3/2.75	3.75/3.5/3.25	4/3.75/3.5	3.5/3.5/3.25	3/3.5/3.5	3/3.25/3.25	3.5/3/2.75
3/3.25	3/3.25	3.25/3.5	3.5/3.5	3.5/3.25	3.5/3.75	3.5/3.5	2.75/3.5
132	142	56	17	13	28	14	46
8	8	17	20.5	10	19	17	11.5
243	242	490	487	485	487	487	497
5,500	5,000	8,400	11,000	10,500	10,500	11,000	5,990
51.18	51.51	61.38	66.78	63.25	65.80	63.24	50.54

							
+ Compact - Sub-par earphones	+ Compact - Sub-par earphones	+ Easy navigation - None in particular	+ Easy to navigate - Joystick not easy to use	+ Easy to navigate, fast file transfer - Joystick not easy to use	+ Easy-to-use keys and navigation - Average build quality, design seems overdone	+ Good stereo speakers, fast file transfer - Feels bulky	+ None in particular - Non-standard audio connector

### Data Transfer

Given an average of 15 hours of playback time on a single charge, spending a couple of minutes to transfer songs should not be a big deal. But, when a player is used as a thumb drive, the transfer rate becomes a parameter to consider. Transferring 100 MB of data to models with USB 2.0 takes about 15 seconds, while the slower ones with a USB 1.1 take a lethargic 190-odd seconds. If you intend to use your player to frequently transfer files between PCs, look at USB 2.0 models.

### Battery Type And Life

One of the ways of cutting costs and simplifying circuitry is by making the players run on standard AAA or AA batteries instead of internal rechargeable ones. This is the philosophy we saw followed in the entry-level segment. The XFREE XFL and MSI Megaplayer series lasted eight hours of continuous use, while the Creative Muvo series served twice that much with 16 hours. The Samsung YP C1 ran a full day on a single AA cell. The higher-end

Photographs: Sandeep Patil



Samsung YP-D1

models sport rechargeable Lithium-ion polymer batteries, which have a longer life. The downside is that you need a PC's USB port (or an optional AC adaptor) to charge them. Coming close to the 20-hour bracket were the YES 920 and 922, Samsung's YP Z5, and the Sony NW series.

### In Conclusion

This contest was a close one and well fought. Brave attempts by manufacturers—a cube-shaped player, video playback on painfully tiny screens, a PC lock feature, multi-colour backlights, a player embedded in sunglasses (*refer page no. 62*) and what not! *Digit* lauds these attempts—this is how products get better and better for us!

Give or take a feature from a player, and the results could have been different. In our contest this time, the winner was from a brand somewhat less-known. Its features, value for money, a GB of storage, and of course, good sound quality helped the SAFA Q100 take the *Digit* Best Buy Gold honours. We found little to complain about with this player. A job well done, SAFA!

## Graphic Equalisers And Music Volume

Your music system has a 12-band equaliser, the MP3 player you are going to buy has a six-band equalizer, and so on. But does it matter? Why has *Digit* conducted the audio tests with the equalisers turned off? How many times have you tried playing with those controls, only to realise that your music actually sounds odd or even bad? The reality is that equaliser control is an unduly-hyped feature in audio systems.

An equaliser is meant to fine-tune the audio system to the environment where it is placed, and not to change the music itself—though most home users do precisely that. Let us gain an understanding of what frequencies are. The music you hear is composed of frequencies spread from 20 to 20,000 Hz in theory (practically, though, most people hear sounds from about 50 Hz to about 15,000 Hz). Different instruments and voices give out different frequencies. For example, the drums give low-frequency sounds called the bass, the treble is the high frequencies, such as the higher sounds of a violin, and the “mids”—the frequencies that fall in the middle of the range—are typically dominated by voice. An equaliser allows you to increase or decrease a particular set of frequencies, thereby altering the levels of various instruments and voices.

When it comes to music, it is the job of the music director to play with the levels of various tones and instruments. He is presumed to be competent enough to choose the best settings for his song, knowing well all the instruments that have gone into its making. When you change the settings on your system, you will be throwing away the sensibilities of the music creator, losing out on the intended experience.

Sometimes, the ambience of the room where a system is placed will affect the way certain frequencies come across to us. To offset this variation, equalisers are provided so that after careful observation, the user can negate the effect of the environment (such as furniture and curtain placement). Another use that equalisers find (though this was not originally intended) is to overcome some shortcomings of a system. For example, take the

case of a typical entry-level MP3 player that does not produce treble at the same level as the bass. When connected to a music system, you can neutralise this effect by sliding the bass control down or the treble control up.

In many cases, simply keeping the equaliser off will provide you with the best sound. Even when you need to change the settings, the amount of change should not be more than 20 per cent. If you need to change the levels more than this, there's something seriously wrong with your speakers or with the player itself.

You might want to move the equaliser settings about if, for example, you love bass and want more of a thumping effect—or, for that matter, for highlighting any particular instrument. But remember that what you'll be listening to isn't what the music director intended!

### Don't Play With Your Ears

When you play your music loud, it is not just your neighbours who have a problem: your ears are complaining too! Prolonged listening to loud music, whether through headphones or speakers, is harmful to your ears and can lead to tinnitus (ringing in the ears) and even hearing loss. This is a fact acknowledged even by manufacturers. Apple, in fact, recently released a firmware upgrade that allows a user to switch on a “safe” mode, in which the volume cannot be increased beyond a particular safe point. This preference can be turned off if the user wants to.

How do you know if the volume is too high for your ear? The answer is simple—if sustained hearing for more than 10 minutes causes even slight discomfort, it is too high! Do not ignore the discomfort—you will lose your sensitivity for low-volume sounds, and your pain threshold will increase. If you're already listening at high volumes and can't sense any discomfort, you probably have people around you who are complaining (in the case of speakers, at least), and it's time to move the volume knob to the left. Enjoy your music, but watch the volume!

Closely contested for this position was the Samsung YP D1, with the same storage capacity and bundled with features. Samsung have put in an excellent 2MP camera! Be it a vacation or an award ceremony, recording sights and sounds besides listening to great music, all a single device, is something anyone would want. But for its MRP of Rs 21,500, it could have been the Gold winner. As it stands, it has to make do with the Digit Best Buy Silver.

Other players that grace the hall of fame—but just about missed out on being winners—are the Apple iPod nano with its 4 GB of memory, the Samsung YP C1, Cowon iAudio U2, SAFA M820 and M850, Transcend T.Sonic 610, and the YES YMP 920, 921, 922 and 928.

### HARD DRIVE-BASED PLAYERS

Thus far, we've looked at plenty of Flash-based players, and there's a good chance you've already settled for one. But don't rush out to buy just yet—there are the hard drive players to look at as well!

Flash-based players are more rugged and less prone to damage than those running on a hard drive. This is because a hard drive has moving parts. Flash-based players are thus to be preferred where chances of the device falling or bumping are high.

Despite this advantage, the primary drawback of Flash-based players is their storage capacities. They generally don't offer over 4 GB. Moreover, as the capacity nears the 4 GB mark, the cost of the product shoots up exponentially. This is where hard drive-based players come in.

Players built around hard drives start from 5 GB and routinely touch the 60 GB mark. Some even go up to 120 GB. Generally, these players are expensive, starting at little over Rs 10K and crossing the 30K line.

Taking advantage of the huge space on offer, manufacturers are looking to develop this category into Portable Media Center players. Such players will play songs, videos, and record video; they'll include PDA tools and many such advanced features.

In order to cram higher capacities into smaller form factors, HDD-based players now employ tiny microdrives. MP3 players belonging to both types—regular hard drive and microdrive—have been tested here.

This category saw six players, three of them HDD-based and three microdrive-based, from three manufacturers—Apple, Sony, and Creative.

Since we conducted such a test only a few months ago—in October 2005—we were afraid there would be a repetition of products in the current test. But to our surprise, we have four new players in this category, along with the Creative Zen Vision, which we've featured separately.

### A Look At Features

Apart from greater capacities, let us see what these players offer that their Flash-based counterparts do not.

### The Display

For the price tag attached to these players, one would expect colour displays at the least. But to

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**The Creative Zen Vision**

**The 30 GB Portable Media Center**

A little after mid-2005, Creative rolled out its Zen Vision, a product aimed at the Portable Media Center segment.

The Creative Zen Vision sports a 3.7 inch 262K SharpPix™ colour screen with a maximum resolution of 640 x 480. The player makes an immediate impression with its large screen and black magnesium finish. Going beyond looks, it can transfer photos from Compact Flash cards on the fly, and it also supports playback of AVI, MPEG 1 and 2, WMV, and the DivX video formats. It also happens to be TiVoToGo-compatible, for viewing TiVo-recorded videos. Button placement is designed to suit single-handed operation. Most of the buttons for playback and navigation are located on the right; this makes it convenient for right-handed people, but is uncomfortable for left-hand use.

A high Signal-to-Noise Ratio (SNR) of 97 db means the Creative Zen Vision delivers dazzling sound quality. Music files can be transferred to the device from a PC through the USB 2.0 interface. The transfer and (if necessary) encoding of media files are executed by Zen Vision Media Explorer, a bundled software that enables synchronisation with the device. FM tuning with a 32-channel preset, as well as FM recording, are included.

Despite the high resolution and great colour screen, we found the viewing angle to be poor—the picture clarity is affected even if you move your wrist a little bit. This is an area where Creative Labs needs to work on. The large screen definitely adds to the pleasure of watching video on the go. Add to this the amazing sound quality and photo support, and what results is a wholesome Portable Media Center player.

What's more? The visionary Zen (pardon the pun) also includes an inbuilt microphone, and the interface displays volume levels for better-quality voice recording. The embedded Organiser provides Calendar, Tasks, and a Contact List, and syncs with Microsoft Outlook. You can choose to wake to your favourite music with the "Wake-to-any-music" alarm featured in the clock settings. Media files on the player can also be viewed on a TV through the A/V interface port.

Now let's talk price. Creative has priced its Zen Vision at Rs 29,900! Compare that to the Apple iPod 30 GB with video playback at 20K. But the iPod has a smaller screen and fewer colours at 64K, while the Zen Vision is more than double in both these features, at the same capacity. Plus, in order to interface the iPod to your TV, you'll need to purchase an AV connection kit, which costs about Rs 5,000. We think the 10K difference is more than justified!

our disappointment, only the Apple iPod and Creative Zen MicroPhoto have colour screens. While the Zen Micro and Sony NW-HD5 have respectable dot matrix LCD screens, the Zen Neon has a mediocre three-line LCD display. Only the Sony NW-A1000 and Creative Zen MicroPhoto have OLED screens. The latter features a 262K colour screen. It was really sad to see Sony's sexy NW-A1000 miss out on colours.

The Apple iPod maintains the standard 64K LCD colour screen. The screen has a wide viewing angle to complement its video playback capability.

**Playback Formats**

The Apple iPod rules in this department. It supports AAC, MP3, MP3 VBR, AIFF, WAV, and Audible, apart from its proprietary Apple Lossless. Sony supports MP3, and pushed its ATRAC3 format via its player. Any format other than MP3, such as WMA, would be converted to ATRAC by Sony's bundled software, called SonicStage. Creative maintains the standard MP3-WMA-WAV format support.

The iPod, in addition to audio, can play back videos in the M4V, MP4 and MOV formats. The Creative Zen MicroPhoto and Apple iPod support JPEG image viewing.

**Flaunt Value**

Looks matter, and the gadgets we're looking at here *should* have flaunt value! Apple did not have anything new to offer in terms of design. The iPod has just tanned from white to black. The design and dimensions, however, remain the same. But why change a good thing?

The Creative Zen MicroPhoto looks

better than its sibling, the Zen Micro, thanks to the subtle changes—or rather corrections—in the design of the latter's touchpad and edges, which reflect elegantly on the Zen MicroPhoto. The former, however, has not undergone any changes—perhaps Creative wanted to distinguish the two players in the same series without major restructuring.

The Creative Zen Neon looks mediocre—the screen has a multicoloured backlight, which just isn't cool anymore! Along similar lines, we didn't like the design of the Sony NW-HD5—poor screen, interface and portability.

The head-turner among the six products was Sony's NW-A1000. It was the sleekest and the most stylish of them all. The menu buttons are highlighted by a subtle backlight, while the unit's brilliance lies in its OLED display, encapsulated within its translucent front casing. You will have no idea about the boundary of the screen until you turn it on. The display is bright and visible even under direct sunlight. We just wish it had a colour display!

**A Look At Features**

The Apple iPod has a marginal advantage over the Creative Zen Photo as features go. It has support for a variety of audio formats, and adds miscellaneous stuff such as a volume limiter with a parental lock, a calendar and to-do, games, a world clock, and a stopwatch timer. Similarly, the Zen MicroPhoto has voice recording, a calendar, tasks, and themes, and it can also synchronise with Microsoft Outlook to import contacts.

The iPod has 22 inbuilt preset equaliser modes. However, you might



Sony A-1000



not need any of those. (Read *Graphic Equalisers And Music Volume* to learn why.) Both the Zen Micros and the Sony NW-HD5 have eight preset equalisers, while the rest have five.

It can be annoying to turn on your PC every time you want to charge your MP3 player. A separate power adapter is a wise accessory. Only the Creative Zen Micro, apart from the Sony NW-HD5 and NW-A1000, provide a separate power adapter.

### Ergonomics And Ease Of Use

Among the products we received, we preferred Apple's interface, which is simple and responds precisely to the touch. After the iPod are the Creative Zen Micro and Zen MicroPhoto. Both have nearly the same menu structure: the Zen MicoPhoto has the advantage of a colour screen. Sony's NW-A1000 also has a good interface with a well laid-out menu structure; compared to this, the Sony NW-HD5's interface seemed a bit arid. However, the notable feature of its interface is the "Orient Screen" feature, by which you can choose between the landscape and portrait modes. The Creative Zen Neon's interface is no different from those seen in the Flash-based Creative MuVo series.

### Synchronisation Tools

Except for the Creative Zen Neon, all the players in this category require installation of a driver and a synchronisation tool in order to transfer data to and from a PC. The iPod needs to be managed using iTunes, while each of the Zen Micros require separate software.

Sony's SonicStage helps transfer files to its NW-HD5, while the NW-A1000 requires the Connect software. The most convenient of all these tools is iTunes. On connecting the iPod to a USB port, it shows up under iTunes as a device. Drag and drop your music and you're done—file transfer begins immediately. You can list video files in the iTunes video playlist, and just right-click to convert the file for playing on the iPod. However, the conversion takes quite a long time as compared to the other



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Scoreboard		HDD-Based MP3 Players				
BRAND	Apple	Sony	Sony	Creative	Creative	Creative
MODEL	iPod (Video)	NW-A1000	NW-HD5	Zen Micro	Zen MicroPhoto	Zen Neeon
Features (35%)	23.765	16.065	15.19	19.18	22.33	18.48
Storage Type / Capacity (GB)	HDD / 30	HDD / 6	HDD / 20	Microdrive / 5	Microdrive / 8	Microdrive / 5
Battery Type/ Rechargeable (Y/N)	Internal Li-Ion/✓	Internal Li-Ion/✓	Internal Li-Ion/✓	Replaceable Li-Ion/✓	Replaceable Li-Ion/✓	Internal Li-Ion/✓
Display Type (OLED/LCD) / Colours	LCD / 64K	OLED / Multi	LCD / Multi	Dot matrix LCD	OLED / 262K	Dot matrix LCD
PC Interface	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0
Supported Formats	Audio: AAC, MP3, MP3 VBR, Audible, Apple Lossless, AIFF & WAV Video: M4V, MP4 and MOV	Audio: ATRAC3, MP3 Video: NA	Audio: ATRAC3 & MP3 WMA/WAV files are supported via transcoding to ATRAC3/Plus Video: NA	Audio: MP3, WAV, WMA Video: NA	Audio: MP3, WAV, WMA Video: NA	Audio: MP3, WAV, WMA Video: NA
Firmware Upgradeable (Y/N)	✓	✓	✓	✓	✓	✓
Voice Recording Format / Bitrate	✗	✗	✗	✓	✓	✓
FM Tuner / Recording (Y/N)	✗/NA	✗/NA	✗/NA	✓/✓	✓/✓	✓/✓
Direct Line-In Encoding	✗	✗	✗	✗	✗	✓
Text / Photo / Video Support	✗/✓/✓	✗/✗/✗	✗/✗/✗	✗/✗/✗	✗/✓/✗	✗/✗/✗
Presets / Customisable Equalizer (Y/N)	22/✗	4/✓	8/✓	8/✓	8/✓	5/✓
Trackmarking A-B repeat	✗	✗	✗	✗	✗	✓
Playback Features (Y/N)	✓	✓	✓	✓	✓	✓
Custom Playlist / Track Repeat / Shuffle Tracks	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓
Miscellaneous Features	Volume limiter, calendar + to-do, contacts, games, multi-city clock, notes, stop-watch timer	AVLS, Artist Link function, modes of shuffle e.g. time machine shuffle, all songs listed as A-M, N-Z and 0-9	AVLS, Screen Inversion, Screen Orientation	Voice recording, syncs with Microsoft Outlook Contacts, Calendar and Tasks	Voice Recording, Syncs with Microsoft Outlook Contact, Calendar and Tasks, Inbuilt Colour Themes	Multiple backlights
Accessories (5%)	3.78	4.19	4.08	5.00	4.00	3.78
Bundled Software + Accessories	iPod software + iTunes, USB cable, carry case	Connect Player PC application software, USB cable, extension cord for earphones	SonicStage, Earphones, Pouch, USB Cable, Pouch, USB Cable	Zen Micro CD, Dynamic Bass Response earphones, carry pouch, USB cable, removable rechargeable battery, remote	Zen MicroPhoto CD, Dynamic Bass Response earphones, carry pouch, USB cable, removable rechargeable battery	Creative MediaSource, Carry case with belt clip, USB Cable
Separate Power Adaptor /Remote (Y/N)	✗/✗	✓/✓	✓/✗	✓/✓	✗/✗	✗/✗
Ergonomics & Ease of Use (10%)	6.74	6.50	5.96	6.63	6.71	6.00
Dimensions (Inches) (H x W x D)	4.1 x 2.4 x 0.55	3.47 x 2.16 x 0.74	3.52 x 2.2 x 0.57	3.3 x 2 x 0.7	3.26 x 2 x 0.7	1.83 x 3.14 x 0.63
Weight (gms)	156.59	109	125.553	108	115	75
Intuitive Button Placement (So5)	4	3.5	3.25	3.75	3.75	2.5
Interface/Menu Navigation (So5)	4.25	3.5	2.5	3.5	3.75	2.5
Earphone Comfort Factor (So5)	3.75	3.5	3.5	3.75	3.75	2.75
Portability (So5)	3.5	3.75	3.5	3.5	3.5	3.75
Vibration Felt (Y/N)	✗	✗	✗	✗	✗	✗
Build Quality (So5)	3.75	4	3.75	3.75	3.75	3.5
Performance (35%)	23.00	21.16	22.16	21.30	21.37	20.93
Audio Quality (Scale of 5)						
Bass/Treble/Electronic	4.25/4.25/4.25	3/4/4	2.5/3/3	4/4/4	3.75/4/4	3.5/2.5/2.5
Vocals/FM Playback	4.25/NA	3.75/NA	3/NA	3.75/3.75	3.75/3.75	3/3.5
1GB Data Transfer (in Secs)	134	146	161	308	216	315
Battery Life (hrs)	7	9.5	24.5	10	8.5	18
Usable Capacity (in GB)	27.8	5.63	18.6	4.63	7.43	4.61
Price (Rs) (15%)	19,800	15,990	19,990	13,490	15,990	12,900
<b>Overall Score</b>	<b>69.28</b>	<b>50.61</b>	<b>54.61</b>	<b>54.77</b>	<b>58.01</b>	<b>51.96</b>



+ Amazing sound quality, plays video  
- No FM



+ Styish, elegant and futuristic design  
- Low battery life



+ Long battery life  
- Poor sound quality



+ Great sound quality, FM radio  
- None in particular



+ Great sound quality, FM, photo support  
- None



+ Good sound quality, FM radio  
- Poor display screen

**Note 1:** AVLS = Automatic Volume Limiter System

**Note 2:** A price index is calculated from price and storage capacity. This makes up 10% of the Overall Score

Contact Sheet		MP3 Players	
Brand	Company	Phone	E-mail
Apple	Apple Computer International Pvt. Ltd.	1800-425-4683 (Toll Free)	indiainfo@asia.apple.com
Bravish	Mediaman Infotech Pvt Ltd	022-23828100/8200/3100/3200	sales@mediamangroup.com
COWON	Lipap Systems Pvt.Ltd	022 - 28743457/28759382	lipap@vsnl.com
Creative	Creative Asia Labs	9840160005	india_getcreative@ctl.creative.com
Genius	Transtek Infoways Pvt. Ltd	95-250-3250072/9821170002	amit@ttek.in
mobiBLU	Mediatech India	022-26361111	info@mediatechindia.com
MSI	Micro Star International Ltd.	011-51758808	info@msi-india.com
NU	Mediatech India	022-26361111	info@mediatechindia.com
Orite	Mediatech India	022-26361112	info@mediatechindia.com
SAFA	Arihant Computers	022 23822424	arihant_computers@vsnl.com
Samsung	Samsung Electronics India	011-4151-1234	ankhee.m@samsung.com
Sony	Sony India Pvt. Ltd.	011- 55006600	sonyindia.care@ap.sony.com
Transcend	Mediaman Infotech Pvt Ltd.	22-23828100/8200/3100/3200	sales@mediamangroup.com
UMAX	Neoteric	022 -39828600	sales@neoteric.co.in
XFREE	Transtek Infoways Pvt. Ltd	95-250-3250072	amit@ttek.in
YES	Thakral Computers Pvt Ltd	9833596973	sales@raffles.co.in

HDD-based video player—the Creative Zen Vision. The Creative Zen Micro and Zen MicroPhoto’s explorer software is also easy to use, and so is Connect for the Sony NW-A1000.

### A Look At Performance

Performance is just as important as features. As we have mentioned in *How We Tested*, we put these six gadgets through the same tests.

### Audio Quality

The sound quality of the Sony NW-A1000 is great, with 3D effects, but it was not as detailed as the iPod’s. The iPod seemed to have the right mixture of bass and treble levels with the equaliser disabled. Tracks such as *Smack my b\*\*ch up* by Prodigy sounded wonderful on the iPod. So was *Punjab* by Karunesh—each note was clear and distinct.

The Creative Zen Micro series, too, delivered quality audio. Sony’s NW-A1000 rendered tracks by Joe Satriani and Steve Vai well. The other Sony—the NW-HD5—simply did not belong in the league of Sony! Whether the problem was with the unit or the earphones, the sound just wasn’t up to the mark.

Without a doubt, the Apple iPod leads in audio quality, followed by the Creative Zen Micro series and the Sony NW-A1000.

### Data Transfer

The result of this test mainly depends on the syncing software bundled with the product. iTunes did well to help the Apple iPod score the fastest transfer,



Apple iPod 30 GB (Video)

with the Sony NW-A1000 on its tail. The Creative players fell on the slower side.

### Battery Life

The Sony NW-HD5 clocked over 24 hours of battery life! The NW-A1000 could manage a little less than half the time set by its cousin. However, Sony claims higher battery life for both their products, and we think their figures are a bit optimistic.

The Creative Zen Neon is in second place, recording 18 hours in the battery drain test. For a change, the iPod fell into the last spot with the lowest battery life of seven hours, about an hour and a half less than the Creative Zen MicroPhoto.

### The Winner

This test did not see stiff competition, and we can conceivably attribute this to the absence of players from iRiver and Samsung, which were adjudged the winners last time round.



The quality of the Apple iPod is never in doubt, but it lacks features



Creative Zen MicroPhoto

such as an FM tuner. Nevertheless, the inclusion of video playback and the drop in the price tag has ensured that the Apple iPod 30 GB Video wins this battle hands down. It is a pleasure to award the Digit Best Buy Gold to a player with such amazing sound quality. The Creative Zen MicroPhoto comes second, and takes the Digit Best Buy Silver.

### In Conclusion

We have seen a lot of improvement in MP3 players in a very short period. When we last tested MP3 players, the Samsung units (YP-T8 and YH-J70) bordered on being “Portable Digital Media Players” rather than being just digital audio players. If the trend continues, we will see more features added. In fact, this time, we saw an upgrade of the Samsung YP-T8 in the form of the YP-D1, with an added 2-megapixel camera and improved sound quality.

Manufacturers are aiming at the “Portable Digital Media Center” segment. We have witnessed the launch of players such as the Creative Zen Vision to fill this category. Others such as the Archos AV400 and the iRiver PMP have already made a name in this category. We’re even seeing Flash-based players aiming for the same bouquet of features as their HDD-based cousins. ■

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kailas\_shastri@thinkdigit.com

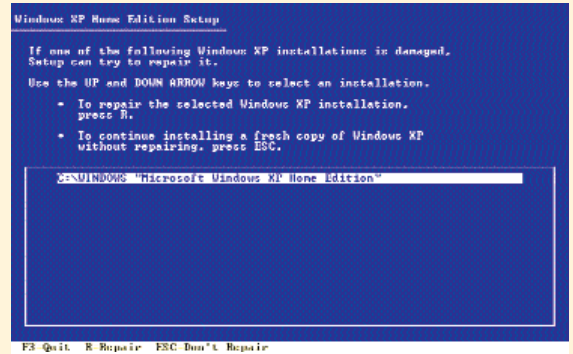
# TAKE a CRACK

Installing Windows XP requires you to be at your computer. Is there a way to do away with this, and automate the installation?

Write in with the subject "Take a crack", and your postal address, to [takeacrack@thinkdigit.com](mailto:takeacrack@thinkdigit.com) with your solution

## THIS MONTH'S CHALLENGE

# Automate the installation of Windows XP



## LAST MONTH'S CHALLENGE

## Without using a third-party tool, how would you display your company's logo on the Windows XP logon and shutdown screens?



### Take a Crack and win

#### Ajax In Action

by Dava Crane  
Eric Pascarello  
with Darren Janes

Published by  WILEY-INDIA

### LAST MONTH'S WINNER

**Murtuza A  
Zabuawala**  
Dahod, Gujarat

#### Rules and Regulations

Readers are requested to send in their answers by the 15<sup>th</sup> of the month of publication.

Employees of Jasubhai Digital Media and their relatives are not permitted to participate in this contest.

Readers are encouraged to send their replies by e-mail. Jasubhai Digital Media will not entertain any unsolicited communication.

Jasubhai Digital Media is not responsible for any damage to your system that may be caused while you are trying to solve the problem.

We've only received a solution that *does* require a third-party tool. Here's how to display a logo in the Windows password screen:

**Step 1:** This crack needs a tool called Resource Hacker. You can download it for free from <http://rpi.net.au/~ajohnson/resourcehacker>

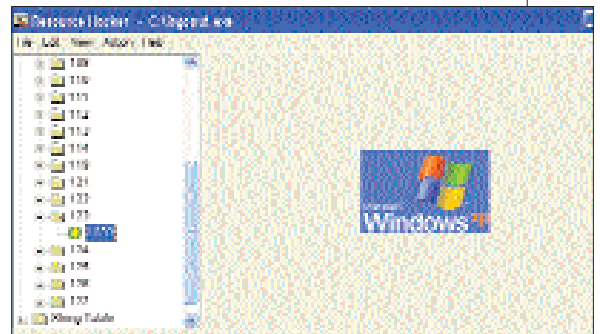
**Step 2:** Create a Restore Point for your System and back up important data.

**Step 3:** Open Resource Hacker. Go to Open in the File menu and type into the Open File text box: "X:\windows\system32\logonui.exe", where X is your Windows XP drive letter.

**Step 4:** You can now see a tree view of the decompiled logonui.exe file. Expand the Bitmap Section go for Name 123 there. You can now view the Windows XP logo. Right-click on 1033, which is in the 123 section.

**Step 5:** Right-click and select "Save [Bitmap: 123:1033]". Save this bitmap to your system. Open the bitmap in MSPaint or Photoshop or any other image-editing program you want. Clear the image and create your company logo instead of the Windows XP logo. Save your file with the .bmp extension. The size of the photo must be 137 x 86—the same as the original. The same procedure goes for 127 in the Bitmap Tree: [Bitmap: 127:1033]

**Step 6:** Once you've created your logo, go to Bitmap 123 > 1033. Right-click on it and go to "Replace Resource..." This will open up a window. Click on "Open file for new Bitmap". Browse for and select your created bitmap. It will open in a second picture box. Click on the Replace button. Do the same for Bitmap > 127 > 1033; right-click on it and go to "Replace Resource..." This will open a



The tree view in Resource Hacker

window. Click on "Open file for new Bitmap". Browse for and select your created bitmap. It will open in a second picture box now. Click Replace. Save the file in X:\windows\system32\logonui.exe. (Replace the original file with your modified file.) You'll get a File Protection Error: "File is not recognized by Windows XP SP2. Please insert the Windows XP SP2 CD and click OK..." Just cancel the dialog box. (Press Cancel and then press Yes.)

That's it! Restart Windows and see the results of your magic!

If you also want change the "Welcome" string, go to the main tree view. Then go to STRING TABLE > 1 > 1033. Replace the string "Welcome" to your name or your company name or whatever!

**Note:** Before you replace your original .exe with the modified one, there's one thing that has to be done, otherwise Windows replace your files to their original form—Windows has inbuilt security for files, to prevent them from getting corrupted, as with logonui.exe. You need to apply a trick to bypass this protection. Open Notepad and type in the following:

```
del %systemroot%\system32\dllcache\logonui.exe
```

Save this file as "crack\_logo.bat" and run it. Use this method at your own risk! ■

**Four 7900GTX GPUs, a 4.26 GHz CPU, an Ageia PPU—Hot hardware in a Hotter package for the über-rich gamer**

Want to run F.E.A.R. @ 1600\*1200 @ 8x AA and 16x AF with Soft Shadows enabled at a consistent 60 fps and above? Any gamer worth his salt will know this was previously impossible. The Dell XPS 600 Renegade will make all this and more possible, because it brings together blistering frame frequency and stunningly realistic visuals.

Powering the XPS Renegade is the Pentium D 965 Extreme Edition running at a supercharged 4.26 GHz. Four NVIDIA 7900GTX GPUs in Quad SLI drive the graphics towards never-before-seen levels of realism. Each of the four GPUs receive 512 MB of GDDR3 memory, making the total available video RAM a massive 2 GB. Ageia's spanking new PhysX PPU makes its appearance here, bringing the total processor count to seven! The PhysX will make effects like ragdoll physics and debris from explosions more realistic, while freeing up CPU resources.

The Renegade features 2 gigs of low-latency DDR2 memory at 667 MHz, packs in two 160 GB 10000 rpm WD Raptors in RAID 0, and a Creative X-fi Fatality. With such a list of jaw-dropping hardware inside, and a 30-inch Dell 3007WFP widescreen LCD outside, the Renegade retails at a just-as-impressive \$9,930 (Rs 4.77 lakh)!

Each rig comes painted by Mike Lavallee, one of the world's foremost automotive artists.

Coupled with the fastest-in-their-class components on the planet, the Renegade is a work of art. Reason enough, we say, to tempt a gamer to sin!



# Dell XPS 600 Renegade



# NU Dark Shadow MP3 Sunglasses

Sanket Naik

It was raining products in the test centre this month, and everyone got his fair share of products to play with. I thought I'd try something unique this time round, and chose the MP3 sunglasses from NU—a good companion on my daily bike commute, I thought. Here's about my month with the shades... nothing earth-shattering, but interesting nevertheless.

## Day 1

Opened up the nice black pouch the glasses came in. The pouch has an inner lining to protect them from damage. My first reaction—"sleek!" I was expecting to see something like Oakley Thump, the first sunglass-MP3 player combo; these are much better-looking. The package includes an additional pair of brown lenses and the USB cable. I would have loved to see ear buds included, though.

## Day 2

The controls, as well as the LED indicators, are located on the right stalk of the glasses. While the earphones on the Oakley Thumps are attached to a small stalk, NU does it with small coiled wires—good; adds that extra bit of flexibility. Unlike most clones, the Dark Shadow has good build quality—it doesn't feel cheap.

There's definitely the cool factor—"Hey, look at me with my shades, and I've got the music on as well!"

## Day 4

Got down to putting some music on the player before leaving for office. Connected the device to my PC; it was instantly detected. With USB 2.0 in action, file transfer didn't take much time. I was off in no time.

When I got on my bike, though, I was in for a rude shock; with the sunglasses on, the helmet simply refused to slide down, and with the helmet on, I wasn't able to position the earphones properly. The

only way out seemed to be to not wear the helmet! If you own a Ninja helmet from Studs, you won't face such a problem. Or, you can wear your helmet loose.

## Day 6

A great thing about these glasses is that they are polarised, and cut off glare from oncoming vehicles. As far as the music quality is concerned, I think it's decent; the bass isn't punchy enough, though. The volume is high enough to reduce disturbance from the surrounding noise—now if only the headphones were noise-cancelling! To be realistic, an FM tuner would have been a welcome addition.

## Day 15

The model I've been using has 256 MB of memory—not quite large enough to store my entire collection (!), but good enough for the daily commute. Models with up to 1 GB are available, though.

The battery is an internal lithium-ion, and though I don't require it, I found that it lasts eight hours. It can be charged via the USB port or the optional power adaptor, which can be purchased separately.

## Day 19

Thus far, I've been using the thing on a regular basis, and it's working out good to cut down on the boredom of travelling. But here's the downside to the whole concept: at office, using it as an MP3 player fails miserably—sitting in front of a PC wearing sunglasses looks terribly funny!

## Day 24

Just for the heck of it, I changed the dark black lens to the brown one. Interchanging them is a simple matter of pulling them out, but it needs to be done carefully—else you could break the plastic lens. The brown lens looks much better with the dark frame.

## Day 30

Overall, I think the NU Dark Shadow sunglasses MP3 player is a nice product. The thing is, realistically, you can only use it outdoors—and only in the daytime. Imagine lying in bed with sunglasses on—what would your mom think if she saw you?

sanket\_naik@thinkdigit.com



# Gaming Using A PPU Vs On A Regular System



Let's take a theoretical game scene of a box about to explode. The scene also contains a building and a person fleeing the frame.

All this data is passed on from the game engine to the CPU for processing

## How Current Games And Systems Compute And Render A Scene

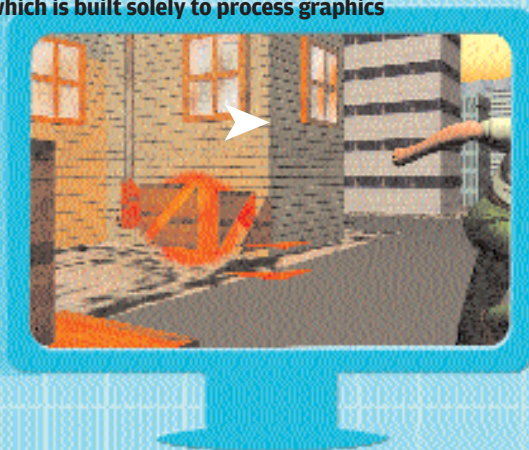


Currently, the CPU keeps all data that requires physics processing and AI processing. Once the CPU is done with these, it only passes all the graphics computations to the graphics card (aka the GPU), which then renders the new position of the object and then outputs the final image or frame

The GPU takes all the graphics data and renders the scene. However, it is often bottlenecked by a comparatively slower CPU, mainly due to the load placed on the CPU because of the physics and AI calculations



The end-result is a scene that has unrealistic explosions and physics. We cannot expect any more, because CPUs, by design, need to be more general purpose, unlike a GPU, which is built solely to process graphics



## How Upcoming Games And PPU-Enabled Systems Will Compute And Render A Scene

Let's now look at the same scene being played out in a system that has a CPU, PPU and a GPU (that's a lot of PUs). As usual, data from the game is passed on to the CPU, which sends all graphics computation to the GPU and does all AI computation by itself. However, it now has the help of the PPU (Physics Processing Unit) to perform complex physics calculations for it

Since the PPU is specifically designed to do physics calculations, it can do a much larger number of calculations in a lot less time than the CPU. In current designs, the PPU will receive data for physics processing from the CPU, but if a game is designed to directly interface with the PPU driver or software, it may bypass the CPU entirely, and this will lead to an even further reduction in the milliseconds of lag that we currently see

The CPU breaks up the data into its respective parts and sends each processing unit its tasks: it computes AI and then passes physics data to the PPU and graphics computation to the GPU for rendering

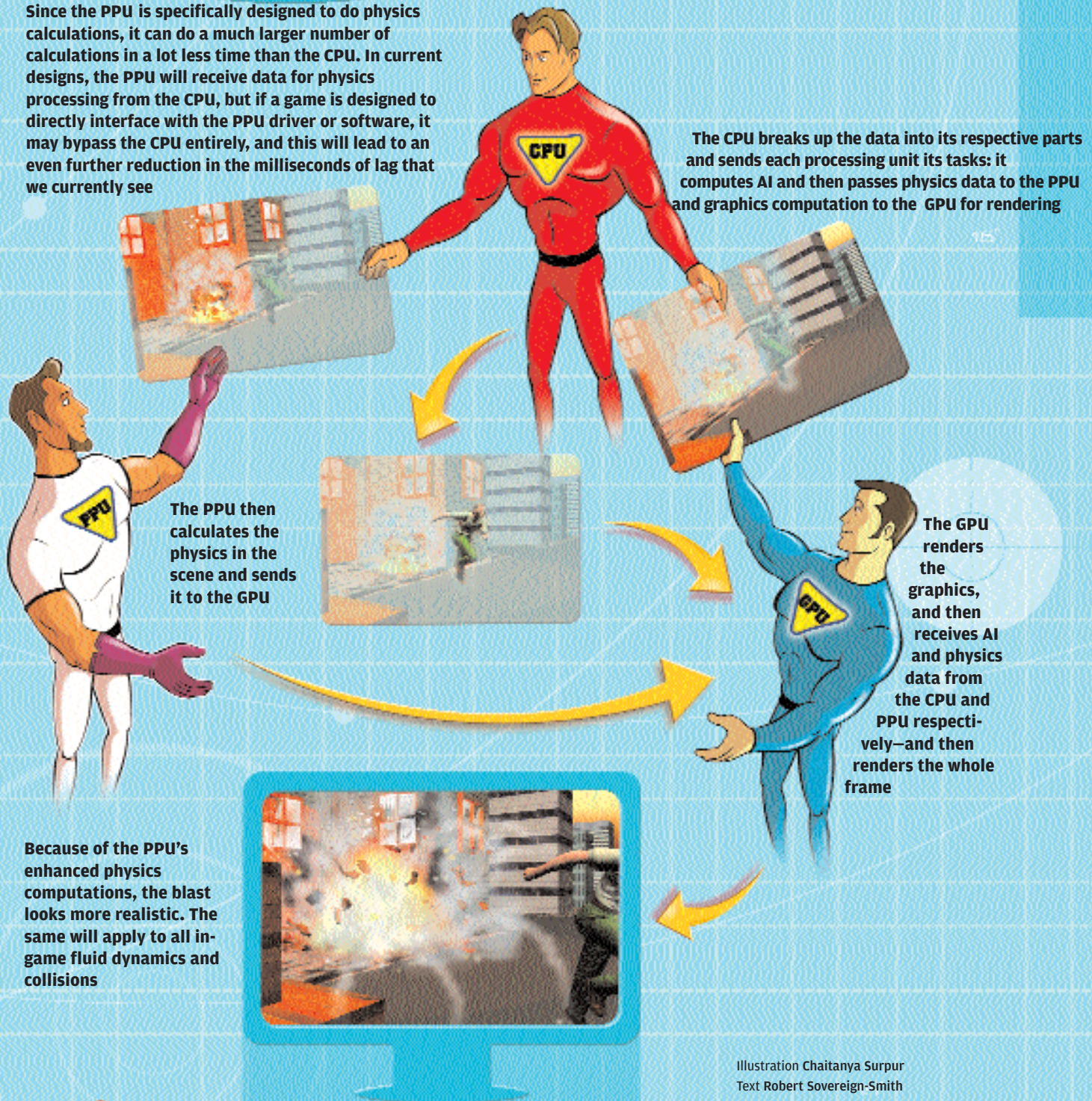
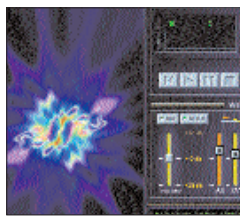


Illustration Chaitanya Surpur  
Text Robert Sovereign-Smith





72 Winamp



81 Tips &amp; Tricks



94 For A Few GB More

## Enhance

# Dude, Where's My Data?

Terabytes of data and not one bit to be found? Here's a self-help guide to efficient data hoarding and smarter data management

Ahmed Shaikh

We download and exchange data everyday. Here, we will introduce software methods to better manage the physical space and the myriad of forms that data can take. We will take a look at hard disk partitioning, spanning data over hard drives, OS features to better represent your data, and briefly touch upon software for cataloguing media, searching for media, and so on. While this has been written specifically for Windows XP, you can apply the same general principles to Linux as well.

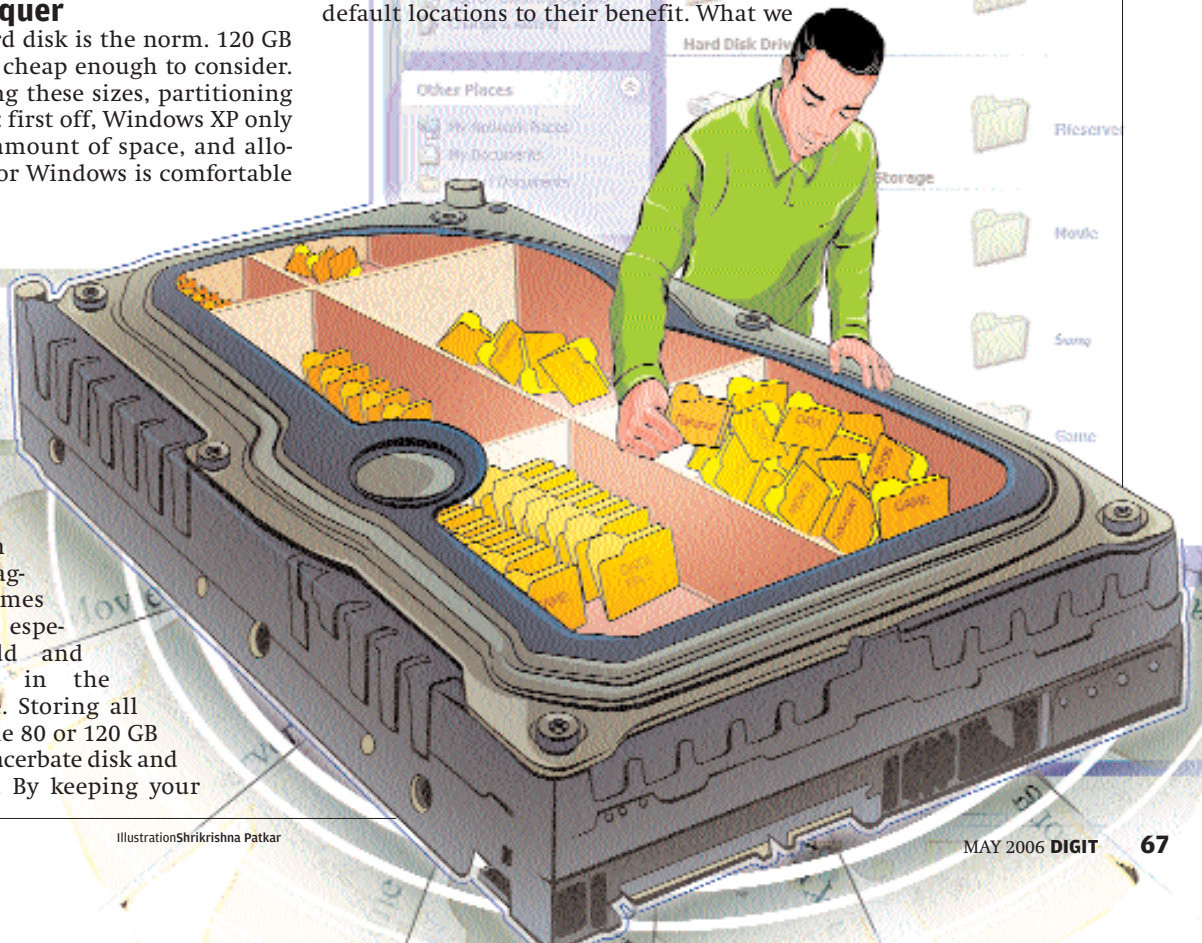
## Divide And Conquer

Today, an 80 GB hard disk is the norm. 120 GB hard disks, too, are cheap enough to consider. With drives touching these sizes, partitioning becomes important: first off, Windows XP only requires a certain amount of space, and allocating about 7 GB for Windows is comfortable enough for the OS. We also recommend moving the Program Files folder (where all your non-OS software is stored) to a different partition. The biggest positive of such a separation is reduction of disk fragmentation: with a big hard drive, fragmentation becomes more pronounced, especially as you add and remove programs in the course of daily use. Storing all your data on a single 80 or 120 GB volume will only exacerbate disk and file fragmentation. By keeping your

programs separate from your OS, you minimise overall fragmentation, make defragmentation much easier, improve disk efficiency and speed, and keep things neat and tidy for OS reinstalls. Another benefit is that you can delete just your Windows install while keeping your program data and documents intact.

## Moving The My Documents Folder

XP has a bunch of folders it terms shell folders, which store a certain type of data. Apart from the Program Files folder we've been speaking of, you have your My Documents, My Music, My Videos, Documents and Settings, and so on. The content of these folders is apparent, and both XP and programs running on XP use these default locations to their benefit. What we



IllustrationShrikrishna Patkar

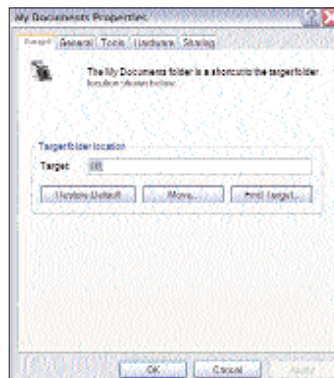
suggest is moving each of these “shell folders” to their own partitions. The good news is that you need not create a separate partition for all these. While we would recommend separating your videos and music to different locations, you should, at the very least, consider giving your My Documents folder its own little room on your hard drive. Since My Documents also lists the My Music and the My Videos folder, this is an encompassing move.

If you have multiple hard drives, you should consider moving the My Documents folder to its own partition on a separate hard disk from the one on which Windows is installed. While a separate partition in itself will reduce fragmentation, and allow for better data management, moving it to a separate disk will also give you performance benefits and a small degree of data safety—programs and your OS are more likely to access your OS/programs hard drive than the hard drive on which you move your shell folders to, potentially giving the latter drive a longer life.

So how do you move your My Documents folder? Simply right-click on the folder and click on Properties, then pick a target drive/partition under the Target folder location field. In our example, we are moving the folder to the H: drive which is located on a separate disk. In this case, the H: drive in itself will be your documents folder; specify H:\My Documents if you wish to locate it under the My Documents folder under the H drive.

If you are going to store your music in the My Music folder and your videos in My Videos, then make sure you give this partition plenty of free space. If you wish to store only your documents (Word files, Excel files, Outlook mail backups, PDFs, HTML files, files transferred over the MSN or Yahoo! Messengers, etc), allocating it 5 GB of space should be quite enough.

Offer as much space as you can to your music and movie partitions. We recommend using separate partitions for these—judge the space to be allocated based on the amount of content you have. If you are the kind who



Moving My Documents to the H drive

moves your data to optical media for storage/ backup purposes, you can give each 20 GB of space. If you like to keep it all on the hard disk, the more the better.

To move other special folders to a new location, right-drag the folder to its desired location and select “Move Here”. Note that you will need to move the Doc-

uments and Settings folder to another partition as well if you wish, at some point of time, to reinstall Windows XP without losing a program’s data.

### On A Drive For More Partitions

If you are the gaming type, consider creating a separate partition for your games. No program will need a dedicated space more than your favourite games will. Those with multiple disks should consider moving the game’s partition to a separate drive.

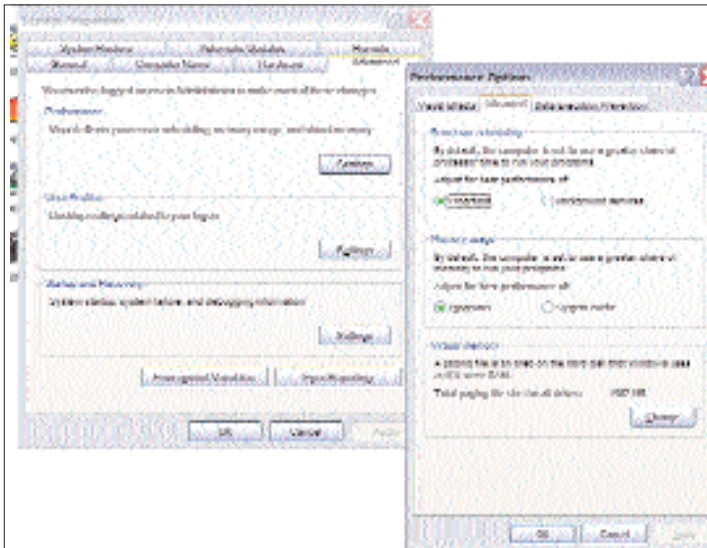
Finally, we have the last piece to this jigsaw—the cache used by Windows XP. The OS creates a memory cache on your hard drive which it uses as a scratch pad. As you might know, when XP runs low on available system memory, it heads to this scratch pad to read and write temporary data to. You can do two things to improve performance here. Assign a dedicated partition to your cache on a separate hard drive, and fix the size of the assigned cache. As a rule of thumb, assign 1 GB more than your system memory for your Windows cache: if you have 512 MB of memory, give it about 1.5 GB; if you have 2 GB of RAM, make your cache 3 GB large. After you’ve created such a partition, right-click on My Computer, click on Properties, then on the Advanced tab, and then the Settings button under the Performance section.

**▼ Tips**

- ▣ Which file system should you choose under Windows XP? FAT32 enjoys the widest support across operating systems and devices. NTFS, however, allows you to compress as well as encrypt your data
- ▣ The My Recent Documents listing on Open/Save dialog boxes is a godsend. Click on it and then type out the initial letters of a folder or a file for quick access to something you visit frequently. You can use a custom icon for each drive/partition. Create a file called autorun.inf on the root of each disk/partition and add this content to it:  

```
[autorun]
icon="YourIconOfChoice.ico"
```

 Save this file. Upon reboot, the disk in question will show the icon. Click on View > Icons under Windows Explorer for the best effect
- ▣ Metadata is vital if you wish to search and organise your content. Make sure that you add this information to the documents you create under Microsoft Office (File > Properties), or the photographs you click, or the music you rip
- ▣ If you multiboot into Linux, consider creating a separate boot partition for Linux: assign about 60 MB of space on your primary drive and make sure that this is a primary partition and not an extended one. You can then mount /boot here and install your boot loader here instead of overwriting your Master Boot Record (MBR). To use Linux’s boot manager, use a partition tool (such as Partition Magic) to make /boot the active partition. If you uninstall Linux in the future, make sure you change the active partition back to Windows’ C: before you remove Linux. This will avoid headaches pertaining to an overwritten MBR
- ▣ If you have multiple hard drives and a motherboard with multiple IDE channels, install each of the main hard drives as masters on separate IDE channels, rather than slaving one to the other. A main hard drive can be one that hosts your operating system and your documents, for example. This will maximise system performance

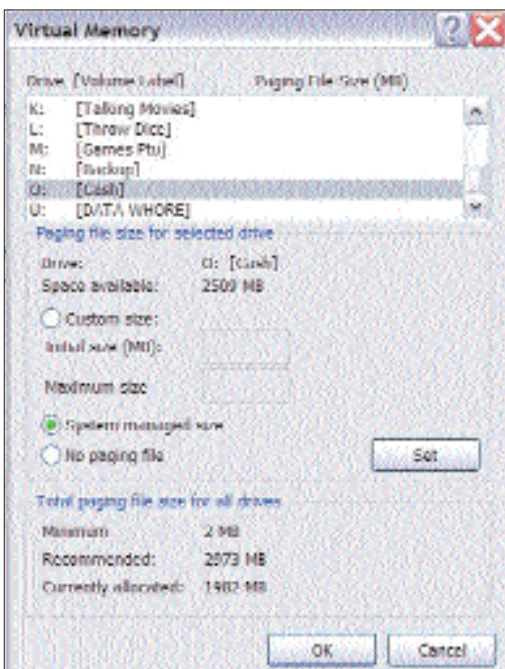


Click on the Change button under the Virtual Memory section to change your Windows XP system cache

Here, click on the Advanced tab once more and under Virtual Memory, click on Change.

Here, note that you can assign a cache file to any of your partitions, remove it from under the Windows partition, and assign it to the one you created. You can either ask Windows to manage the size of this partition, or you can specify the amount allocated. Giving the cache an Initial size and a Maximum size equal to the size of the partition will create a permanent, non-dynamic cache, which improves performance a bit (for example, if the partition is 2 GB, assign 2 GB as the Initial and the Maximum). Click on Set and then Apply these changes. The system will reboot to the new settings.

While we're on a drive to creating new partitions, add one to back up your most important data to. This partition could store data



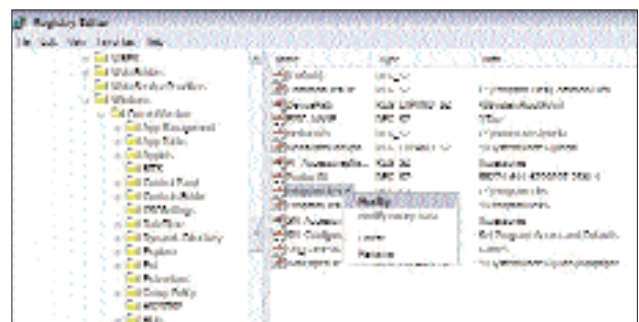
Assigning a partition as your system's cache

such as your Outlook PST files, your bookmarks, your contacts, your RSS OPML collections, your music/video library backup, your picture library backup, and so on. A 2 GB backup partition of this nature should suit most needs.

### Moving The *Program Files* Folder

While moving your Documents folder is just a right-click job, Programs Files takes a bit more elbow grease to get moving. A very important thing to remember is that you will need to do this immediately after a system install for maximum benefit. We are going to do this via a Registry edit: the edit will essentially move the default path to your Program Files to the new location specified. It will not move the contents of the default folder (which is under C: or XP's install drive). What this ensures is that programs that you install in the future will be stored in the new location. This is why it is important to make this change as soon as you finish installing Windows XP.

To access the Registry Editor, click on Start > Run and then type "regedit" in the Run dialog box, and hit [Enter] to run the program. To locate the key we're looking for, press [Ctrl] + [F] and enter ProgramFilesDir in the "Find what" field. This is generally located under this path: HKEY\_LOCAL\_MACHINE > SOFTWARE > MICROSOFT > Windows > Current Version > ProgramFilesDir. You can now right-click on ProgramFilesDir and click on Modify to change its Value data to the new path you want.



Changing the path to your Program Files must be done immediately after installation for best results

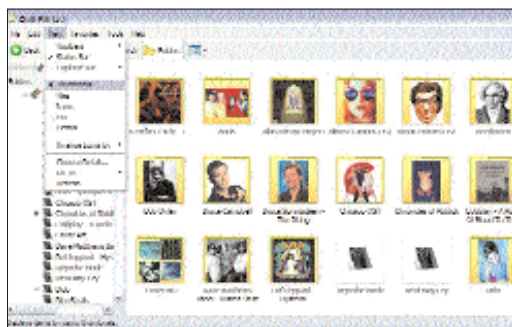
### A View To Change

Windows XP can showcase your folders in a variety of ways, each suited to its contents. These settings can be accessed from under Windows Explorer: look under the View menu. Here we are interested in the "Arrange Icons By" submenu and the Thumbnails, Tiles, Icons, List, and Details options.

The View > Thumbnails option is perhaps of the greatest benefit. It should be used to showcase two types of folders—your pictures folder and your music folder. Applying this view to a folder containing pictures will display your photos as thumbnails, allowing you to open one based on what it represents instead of having to recall its filename. And if you categorize your music into artist and albums, you can represent music folders by either the album art or the artist's profile photo. Click on Choose Picture under the Folder Pictures section to choose a

representative photo. Such visual representations make your music collection far easier to browse through.

While thumbnails are nice for folders containing pictures, XP has an option for your doc-



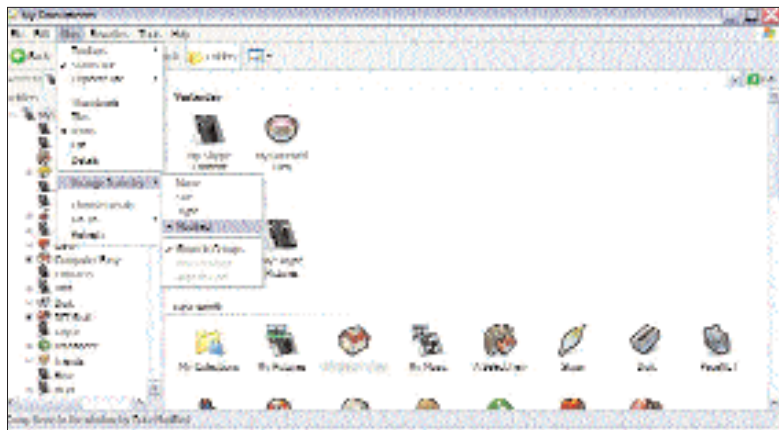
Your music collection will look all the better for Thumbnails, plus it becomes easier to access

uments as well. Windows XP can arrange a folder's contents into groups. Each group is based upon file type, such that you have all your folders together; similarly for your PDF files, your DOC files, your XLS files, and so on. To access this view click on View > Arrange Icons by, and then click on Show in Groups.

While arranging files based on their extensions is useful if you wish to locate an Excel file from within your document folder, you can also use this view to cluster files together based on date. Under the "Arrange Icons by" sub-menu, choose the Modified field to do so. Windows XP will now arrange your folder content according to when you last created or modified it. It arranges content in user-friendly language such as Today, Yesterday, Earlier this week, Last week and so on, stretching to Two years ago. This view thus offers a data timeline of sorts.

### Cataloguing Your Data

Creating partitions, slotting data, and changing default views go a long way to allow access to your data in a more methodical manner. However there are times when you need to rely on software to do the dirty work for you. The most useful of these are programs that create a library of your content—for you to search and access from. Such a library can be



Arranging icons in groups, and then by date modified allows for a timeline-like view of your data

**Recommended**

**Jack of all:** J River's Media Center is a comprehensive catalogue and search tool for a range of media—audio, video, images and podcasts. It also supports advanced features such as CD ripping, audio conversion, automatic online lookup for metadata and album art, music and video syncing to portable media players (including the iPod), a 10-foot interface, and also supports audio and video streaming to supported portables, media players and other computers.

built on top of almost any content type. We will make brief recommendations on the software to use to categorise each media type on your hard drive.

### Your Music Data

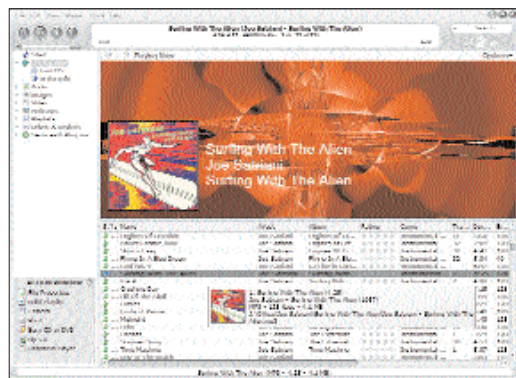
Any music software worth its weight in MB creates, and searches within, a library of your music. This is done across all your folders, partitions, and hard drives. Software such as this will also allow you to search your music library based on ID3 tags and will even let you back up the library. You can choose between Windows Media Player 10, Winamp 5.x, RealPlayer 10.x, iTunes 6.x, and so on. For a player that can handle most of the media out there, apart from offering decent library functionality, we recommend RealPlayer. Apple iPod users should, of course, stick to iTunes for best results.

### Your Video Data

A good music manager will also catalogue your video clips and movies. Once again, you can choose from Winamp, Windows Media Player and RealPlayer, but we recommend RealPlayer for its wide range of media support.

### Your Photos And Pictures

The software to go for here is Google Picasa. It organises your photo content and then lets you perform rudimentary edits on it, and it lets you label it and change its metadata content, rate your photos, print them, create albums, password protect your collections, auto-resizes photos for e-mails... all wrapped under an easy-to-navigate interface.



J River's Media Center software is highly recommended for its music, video and photo cataloguing features

## Other Data: Online And Offline

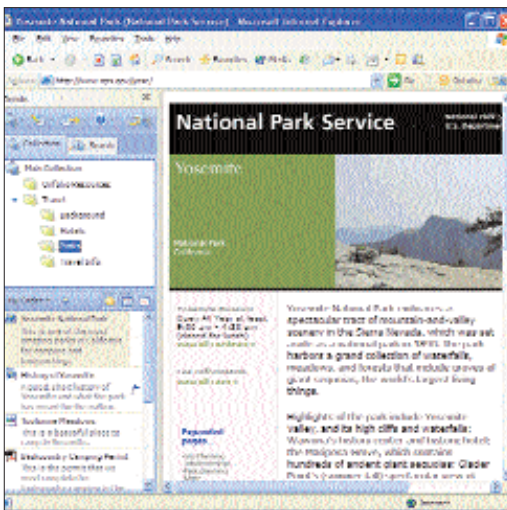
After desktop search made a splash on the computer scene last year, today it's raining search software—and there is no real right choice, since they are all equally up to the basic task. For those unfamiliar with this concept, a desktop search tool indexes your data, or more specifically the metadata tagged to your files, for easy searching. Think of it as running a search engine on your local computer. Search solutions are available from Microsoft, Google and Yahoo!, to list the three most well-known. Each has its strengths.

**Microsoft Live Toolbar:** Microsoft's solution can be installed as part of either the Windows Live Toolbar or the MSN Search toolbar. Installing the Live Toolbar also gives you access to a bunch of plugins, one of which is Onfolio.

Onfolio itself is worth the price of installing the Live Toolbar. The software was recently bought by Microsoft; what it does is, it lets you collate, manage, search and share online content. Onfolio is an ideal Web browsing companion: it can capture online content and then sort it according to research collections, which can be annotated with personal notes, or attached to documents and e-mails.

You can also collate bookmarks, which Onfolio stores as a searchable database, complete with your notes on the Web sites. It can save local copies of Web sites, spanning multiple links, or saving only select elements therein. It also has a very capable RSS feed reader.

You can add comments, custom fields, keywords and flags to any stored content; searching for content is also made possible via integration with Desktop Search. If you're not too keen on using Internet Explorer to access Onfolio's functionality, you can also run it as a standalone application.

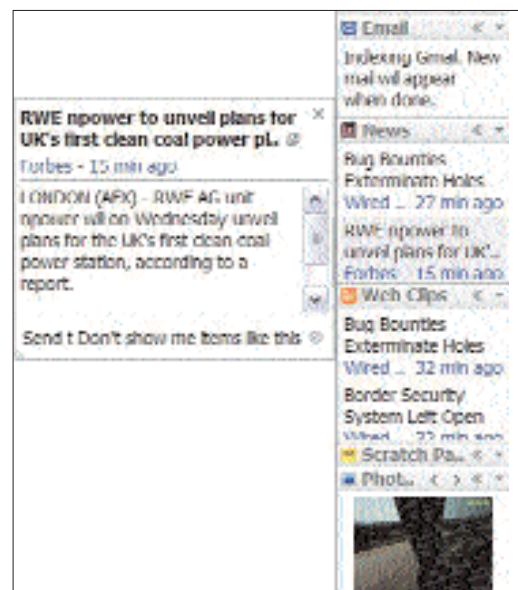


Onfolio can be used to collate a variety of data online

**Google Desktop:** Google seems to follow the mantra of "what Windows Vista promises tomorrow, today." The latest version of this tool not only indexes your files and assorted data, but also offers the Sidebar, which collates sundry information and content into, well, a sidebar on your desktop. The Sidebar is a single-

## Find Your Favourite Tool Here

Google Desktop: [desktop.google.com](http://desktop.google.com)  
 Google Picasa: [picasa.google.com](http://picasa.google.com)  
 iTunes 6.x: [www.itunes.com](http://www.itunes.com)  
 J River's Media Center: [www.jrmediacenter.com](http://www.jrmediacenter.com)  
 Microsoft Live Toolbar: [ideas.live.com](http://ideas.live.com)  
 MSN Desktop Search: [desktop.msn.com](http://desktop.msn.com)  
 RealPlayer 10.x: [www.realmedia.com](http://www.realmedia.com)  
 Winamp 5.x: [www.winamp.com](http://www.winamp.com)  
 Windows Media Player 10:  
[www.windowsmedia.com/download](http://www.windowsmedia.com/download)  
 Yahoo! Desktop Search: [desktop.yahoo.com](http://desktop.yahoo.com)



Google Desktop adds a useful Sidebar

access point to Google mail, Google Talk, Google Web or local searches, to RSS feeds, to Google Maps, and so on and on—a plethora of plugins for the Sidebar ensure that all your bases are covered. Plus it indexes not only your local content but also content from Gmail: that's content from all your local data, over 2 GB of possible e-mail data, and your chat logs a desktop search away. Note that some of these features work by sending data from your computer to Google's servers. Read the post-install notes carefully if you are concerned about your privacy.

**Yahoo! Desktop Search:** Yahoo! licensed its search engine from the X1 search company. X1 is a powerful search known for its speed, accuracy, and the wide range of data types it supports. All that made X1 so great is what makes this offering from Yahoo! one to consider, if all you are looking for is the best desktop search tool and are not interested in things like Sidebars.

Do note that by default, this offering only searches for a limited and common range of files. To enjoy the support for more than 300 file types offered, you will need to download an additional, free expansion pack. ■

[readersletters@thinkdigit.com](mailto:readersletters@thinkdigit.com)



# Winamp

The world's favourite music player keeps getting better and better. Here's some playing around with the myriad of Winamp's controls and options

Ram Mohan Rao

Winamp, surprisingly, has endured. It arrived sometime in 1997, and survived the slew of competing media players that came up after that—some of them Winamp clones—and kept adding features, such as support for video and much more. Now, in version 5.2, its music management and other features are more advanced and useful than ever. Here, we try and get a little into some of the lesser-known aspects of Winamp's features—going beyond just creating playlists and playing them, as it were.

## Some Basics

On the front panel, the preamp is something like a volume control for the equaliser—when you set it right up, all the frequencies you control via the equaliser are pumped up, and the effect of sliding a particular frequency will be more pronounced. The other setting you might not know about is the “Auto” button: when you stumble upon an equaliser setting you like for a particular song—that is, a good equaliser-song match, select Presets > Save > Auto-load preset... The next time that song plays, the settings you chose will automatically load. Something interesting about equaliser presets: you can load a preset from a .eqf file—which is an exportable equaliser preset. So you make a setting and save it as a .eqf, then send it to someone—how cool is that?

## Remix!

In the main window of the General Preferences page—acces-

sible by right-clicking anywhere in the Winamp window and choosing Options > Preferences—there's an option called “Allow multiple instances.” Yes, you can have two Winamp windows open at the same time—and create your own remixes! You could, for example, play a drum track in one window and a slow classical track in another, making for a *jhankar-beat* rendition of Mozart (ugh!). Another, exotic use for multiple instances is to create an eerie, psychedelic reverb effect: you could enqueue the same track in both windows and start one just about half a second (or less, or more) later than the other. Try it!

## Priority And Jitter

You'll find “Priority class” in the same window as above. The higher this setting, the greater the CPU power Winamp will use. Keep it at Idle or Normal for most purposes; if you have a slow computer, and opening a document makes a track skip, you might want to change it to High. Realtime is hardly ever recommended, unless your tracks keep skipping all the time.

Under Video in General Preferences, you'll see something called “Allow YV12 overlay mode.” Without going into the details, checking this option allows Winamp to use the YV12 overlay mode, which can result in better video performance. Under Video, you'll also see “Synchronize video to screen refresh rate.” This increases the fps of the video to reduce jitter and artefacts, if any.

## Playing With Lists

Take a look at Predisix MusicMagic. The MusicMagic

Mixer is a library manager that can compute the key acoustical attributes in music tracks. It's sort of a power tool to create dynamic playlists. The software analyses your collection, and builds custom playlists from analysed songs! You need to be connected to the Net for this.

Why would you want a playlist to be created for you? Well, say you have a music collection that runs into thousands of songs. You're having a party and you need to create a long playlist that will last the length of the party or so. MusicMagic analyses your library using information from its database, which holds “acoustic fingerprints” of all the songs that have been analysed thus far. It gets these songs from folks like you: if you try and add a track that hasn't been analysed yet, MusicMagic analyses it and adds its fingerprint to the database. So what you do is, select a song you like, and press MusicMagic Mix. This will create a playlist full of tracks that are related acoustically to the song you chose as the base.

## Syncing With Devices

Winamp has taken a cue from iTunes in its 5.2 version, and you can sync your device with Winamp. Under Portables > Advanced Sync Settings, you'll find options for the plugins that allow you to manage your iPod or other music device from within the Winamp Media Library. There's a button called “Edit query”: it's pretty easy to use, and you can use it to configure what media types Winamp will sync with your portable device. For example, you can tell Winamp to only sync songs that are larger



than 5K and that also have a bitrate higher than 256 kbps.

The Autofill settings on the same page are self-explanatory once you know what Autofill is. So what is Autofill? It's a cool little feature that leaves you wondering what'll end up on your portable music player! When your music device is synced with Winamp, the Winamp Media Library will sometimes transfer some songs to and from the device. From the device is OK, you can expect that—but what's interesting is that it also transfers songs to the device without telling you! The settings here include options that control the transfer—leave them untouched if you really want a surprise the next time you press Play on your iPod. Otherwise, you can choose to, for example, transfer only high-rated songs to the device.

### Metadata And More

The Media Library holds all your music—rather, it keeps track of your collection. From the menu on the left, you can bookmark items just like in a browser, view recently played and most-played items, and so on. At the top, you can search for items in the library. Here, explore the "Metadata reading settings," even though it's been reported to be buggy (as of now). This is a button at the bottom of the Watch Folders tab. Metadata is added to files by certain programs, for example iTunes, and is basically information about the file such as album and length and so on. Once you press Configure, the options are self-explanatory—you can, for example, choose to "smartly" detect metadata such as track number, artist and title. This, again, is useful when you have too large a music collection, and don't want to go through each song and manually look at what it is. So if you've synced with someone else's iPod, Winamp can display song information you haven't even entered!

### Going To Where You Want

"Jump To File"—also under General Preferences—can be very confusing, with its horrendous number of options. This is an implementation of the JTFE plugin, whose function is to allow you to queue your files to play in an order you specify. There are two methods to achieve this, and

a third method "is being worked on." The first is "Enqueue," and the second is "Move after current..." This latter places the selected file(s) after the currently playing file. For example, under Jump To File > Enqueue Options, you have "Double-click mode": use this to specify whether double-clicking a song will play it (removing everything else in the playlist), move it to after the currently playing song, or simply enqueue it.

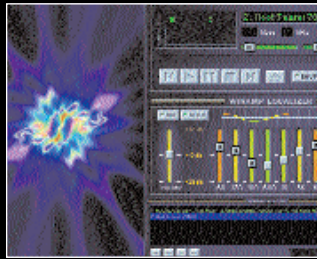
The "third method being worked on" will allow you to enqueue files to play at a given time, with the ability to control when they will be played—based on options such as day of week. It gets exotic: there will be the ability to add a "virtual file" into a "timed queue," which will allow you to close Winamp and/or the system at a given time.

In our opinion, the JTFE plugin has been overdone—there are too many options. However, it can be useful if you have an extremely large music collection. Visit <http://nunzioweb.com/daz/jtfe.html> for more information on the plugin.

### Buffering, Fading, Silence

Under Plug-ins > Input, look at Nullsoft MPEG Audio Decoder 3.5. This is what decodes your MP3s. The first tab lists "Full file buffering"; set this to a high value if you want your MP3s to get into RAM and play from there. This is useful if you have a lot of RAM, and have no patience with the tiniest amount of skipping. Then there's the option between logarithmic and linear for the equaliser. "Logarithmic" (the default) is the opposite of "exponential," and means that increasing a certain frequency boosts it by a *reasonable* amount. Setting it to linear will enable more drastic playing around with the equaliser settings.

If you want songs to play continuously without a gap, here's a way: go to Plugins > Output > DirectSound output, and click Configure. What you need to change is the "Buffer-Ahead on track change." If you set the Buffer-Ahead to 5000 ms, Winamp will begin reading the



Find cool viz plugins at [winamp.com](http://winamp.com)

next track when the current track has five seconds left, allowing for a seamless transition. But if your computer is low on memory, you're better off leaving this setting at the default.

Another interesting setting here is Fading, in the Fading tab. It's irritating to have a song end abruptly, and you can control that here. There are too many options for us to discuss here, but suffice it to say that you can control every aspect of fading you can think of—including whether or not to fade while you're seeking!

The options under Other in DirectSound output are interesting. Here you'll be able to remove the silence at the beginning or ending of tracks—and you can specify what Winamp interprets as silence. You can choose to have the volume control behave in a smooth manner (great if you don't want a song to blast you off your chair when it starts), and you can choose between a logarithmic and a linear volume control.

### SHOUTcast, Skins, Etc

If you like Internet radio, remember that Winamp has SHOUTcast support, and can ably act as your SHOUTcast client. SHOUTcast is free radio—visit [www.shoutcast.com](http://www.shoutcast.com): there's all the genres you can think of, and when you click on a result with Winamp on, it just plays! You can be a broadcaster as well—just check the documentation on the main page for details. Of course, you can also use other media players to listen to SHOUTcast streams.

There are lots and lots of skins and plugins available at [winamp.com](http://winamp.com), and new ones keep coming out. Keep checking the site to find what interests you. Then, consider DFX 7.5 for Winamp ([www.fxsound.com/dfx/](http://www.fxsound.com/dfx/)), which really makes your MP3s sound *much* better on Winamp—you won't believe your ears! At \$19.99 (Rs 900), we think it's worth it. And finally, if you're rich, consider going Pro. There isn't much of a value add except for ripping and encoding features, including ripping to AAC and WMA, but for \$19.95 (Rs 895), you'll be supporting development of the world's favourite media player! ■

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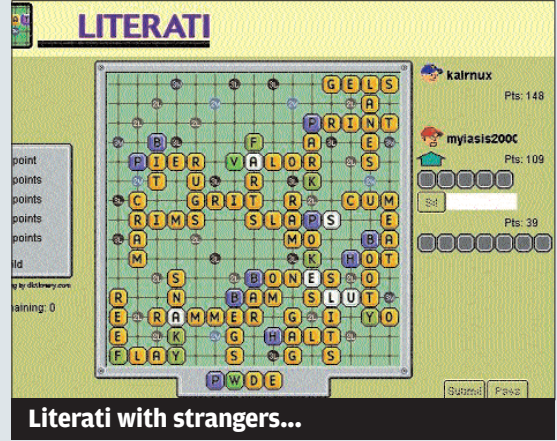
# Playing A Word Game

I've played many games on the Net, but what about a game that's traditionally played on a board? I mentioned the idea to my pals and they just couldn't stop laughing at the idea of playing a game that didn't demand heart-pumping action. Despite their scepticism, I was determined to give it a shot. I chose to pit my experience of Scrabble against it's online cousin Literati. Here's what ensued...

**Jyotsna** ([jjyotsna\\_rege@thinkdigit.com](mailto:jjyotsna_rege@thinkdigit.com))



**Scrabble with friends...**



**Literati with strangers...**

**1**

It had been aeons since I had even thought about playing a word game. Although my friends and I still get together, Scrabble was a thing of days bygone. A dedicated search in the attic for the board proved unfruitful, and I decided I had to buy a new board.

I logged in to the Literati section of Yahoo! games ([games.yahoo.com](http://games.yahoo.com)), and there was much more here than I'd expected. You can sign up to play in the League and Ladder rooms—you have to pay for these—or you can choose to play in one of the Global Game rooms in categories such as Social, Beginner, Advanced and so on, which are free. I dared not take on too many challenges on my first foray, and chose to be "Social."

**2**

A visit to the book/toy store was next. I couldn't remember my last trip there, nor seeing so many different brands! Eventually, I found and picked up a Scrabble for Rs 300.

Well, there is more! A click on the Social game room showed a further thirty or so rooms. Once I was in one of them, I set up my own board, set a time limit for word construction, and soon 'Wicked\_24' and 'abjoy\_d' joined in for the game. There began the first round!

**3**

The following weekend, I proposed a cosy afternoon at the Scrabble table. My proposal was met with silence ("Reading is more the vogue," they said), but my buddies gradually warmed to the idea. Soon we were marking scores and arguing over the existence of words such as "piccolo."

I didn't need to keep a tab on the score or monitor time—the computer kept track for me—a lapse in time results in a player forfeiting the game. I could exchange friendly banter with the others even as I played. I finally won the game—both the others lost out on time. Victory in just 25 minutes beats a boring hour of Scrabble!

**4**

After an hour at the game, we decided to wind up. We had enjoyed our gaffes and word construction attempts, but had also, frankly, gotten bored of the board—pardon the ridiculous rhyme! Maybe we'd outgrown what we'd enjoyed so much as kids. We decided to put our evening to something more exciting than pondering trays of letters. A trip to the CD library followed.

Two discoveries supplemented my win. I could play more than one board at a time, and better still, I received a ranking for every win or loss. This I liked! Being rated actually makes you want to play more—and, hopefully, win more. And hey, I was online and could even surf while playing! No cheat sites for me, though!

Fun Quotient: **2.5/5**  
Total Time Taken: **2 hours**



Fun Quotient: **4/5**  
Total Time Taken: **40 minutes**



**AND  
THE  
WINNER  
IS...**

**A**ll right, I'm hooked! Lets relegate the ol' board game to get-togethers. If you need more than just a pastime for lazy summer afternoons, put down a resolution right now to register online. Playing on the Net demands all the skills a board game does and more—you've got to be sharp

and on your feet! Literati is better designed than Scrabble to boot. You can't argue if you lose a game. There's no going back on your move. And unlike playing it the old way, success online makes you hungry for more, courtesy the rating system!



# http://del.icio.us

Ever caught yourself wondering how many other people online are bookmarking a site you just tagged yourself? Well, now you can find out—and do more while you're at it

Jyotsna Rege

You often find yourself bookmarking sites in your browser, but you can't really carry your stored favourites around with you all the time, can you? Actually, with <http://del.icio.us>, you can bookmark your sites online, which you can then access from anywhere, provided you have a PC and an Internet connection.

## Navigation

At its simplest, like we said, the site is an online bookmarking tool. You have an individual page where you can tag a URL that you want to record or refer to. The page can be a bit confusing for a first-timer, and we recommend that you check out the Help link on the home page if you are altogether new to bookmarking. Much of what the site does has been explained here, and reading all this before you even register might save you a good deal of time. For example, under "Site Navigation," you will find a visual explanation of their navigation tool bar called "Breadcrumbs."

The bookmarking on [del.icio.us](http://del.icio.us) is very similar to the bookmarking procedure you would follow with your browser. The advantage is that with [del.icio.us](http://del.icio.us), you don't have to restrict the number anymore. All your tags are visible on the right of the page in a cloud view. You can also bundle sites under a particular tag to create an open folder of sorts, so that similar pages are clubbed together. Besides, if you want to use two tags for a similar page, you can: a site on Afghanistan might classify as political as well as geographical, so you can tag this as "geographical + political".

## It's Chow Time

So you've created your user profile and have started tagging sites. Here is the next important bit. For every Web site you've bookmarked, you see the total number of people who have also marked the site. Clicking on this statistic will take you to a page where you can see all those other users. From here, you can click on any user's name to check out the sites they have tagged, and

view their choices. If you like something they have, you can bookmark that for yourself. Or you can check out the people who have tagged the same sites as your *host user*, and you can further conduct a search. The interloping of pages and the path you take is continually visible courtesy a toolbar—the Breadcrumb, at the top.

Surfing possibilities at the site are huge. For beginners, your search starts when you discover a similar interest—in this case a Web site—with another user. From there on, you can search under particular tags and also keep a count of the number of bookmarks a site has received.

For example, if a site has been marked by 1,204 users, it's likely that you might like it too—given that you're a "typical" surfer, of course. Then, you can create a community of your own and even tag a bookmark for a friend. Also, any pages marked for you by friends will be stored in your profile page.

## Here's Why...

While you can see some of the bookmarked sites on the home page, you can't bookmark them for yourself or create a page of your own until you register with the site.

You can subscribe to sites under a particular tag such as "economics," and every site with that tag is redirected to your Inbox. If you do not wish to receive sites from a particular tag or person, you can just retag them as "antisocial" in the



A click on the tag statistic shows other users on this page

settings, and they stop featuring on your page.

The site does not take for granted that you know how to use the page: it aids and guides you on how to go about tagging and using its features. There are also explanations for various tools and feeds such as RSS and HTML. To a seasoned user, these directions may look like kindergarten stuff, but it's pretty handy if you're new to a social bookmarking site—of which this is one of the most popular.

Navigating the site does need some getting used to. The site we profiled in this space last month—[digg.com](http://digg.com)—is similar in terms of what you can achieve, but is easier to use. With [del.icio.us](http://del.icio.us), there's a little more work involved—it isn't easy to navigate right from the word Go. The initial couple of hours may be frustrating, but more and more use facilitates better understanding. At the end of a good four visits—assuming you spend at least thirty minutes in each visit—you'll find the site indispensable!

[Del.icio.us](http://del.icio.us) is a welcome alternative to the other online social activities—namely, IM and blogging. Granted, you cannot establish contact with the other users or message them, but the blog on the site provides a way to interact with the [del.icio.us](http://del.icio.us) community.

The site is still being developed, and even as we write this, it mentions changes they're planning to introduce.

If you want to combine utility with a bit of social hobnobbing, [del.icio.us](http://del.icio.us) is the place to be. ■

[jyotsna\\_rege@thinkdigit.com](mailto:jyotsna_rege@thinkdigit.com)



A Profiled page has bookmarked sites

# New & Notable

## Canon Digital IXUS i zoom

### Stunningly Slim

The Canon IXUS is an ultra-compact digicam available in four funky colours. It's big on features, incorporating a 5-megapixel sensor, 2.4x optical / 4x digital zoom, integrated flash, and auto-focus. It features 16 shooting modes, PictBridge, and a one-touch print/share button. Video recording is possible at 640 x 480 at up to 10 fps. The excellent 1.8-inch TFT is crystal-clear, the interface is intuitive and the photographs crisp.

The IXUS features a docking station that works as a charger for the inbuilt Lithium-ion battery, and also connects to the PC via USB 2.0. The inbuilt flash is good enough, but the effective range is only about two metres. Shutter lag makes shooting moving objects a problem.

The IXUS has no internal memory, and comes with a paltry 16 MB MMC card. We recommend at least 256 MB, so add that to the camera's price if you want to buy it.



Rating

Company **Canon India Ltd**  
Price **Rs 25,495**  
Phone **0124-4160000**  
E-mail [yatnesh.pandey@canon.co.in](mailto:yatnesh.pandey@canon.co.in)  
Web site [www.canon.co.in](http://www.canon.co.in)

## Canon IXUS 750

### Pricey Shots

"A large feature set and an even larger price tag" best describes the Canon IXUS 750. Catering to the semi-professional and the indulgent enthusiast classes of photographers, this 7.1-megapixel camera sports a superb 2.5-inch screen.

Zoom is the standard optical 3x and digital 4x. Shoot modes include: nine scene, auto focus, three white balancing, portrait and night. Other features include USB 2.0, customisable power saving options and themes, warning of camera shake probability, and many more goodies that can really put a smile on your face!

The images we shot were rich and clear, and the video is VGA at 30 fps with mono sound or at 60 fps and 320 x 240.

Excellent camera, no doubt, but the smile ends as soon as you hear the price—Rs 29,995!



Rating

Company **Canon India Ltd.**  
Price (estimated) : **Rs 29,995**  
Phone **0124-5160000**  
E-mail [yatnesh.pandey@canon.co.in](mailto:yatnesh.pandey@canon.co.in)  
Web site [www.canon.co.in](http://www.canon.co.in)

## JVC Everio GZ-MG20e

### No More Tape!

The JVC Everio GZ-MG20e DV cam comes with a 20 GB hard drive that promises to make tape media obsolete. This camera is amazingly light—just 380 grams.

The camera has no viewfinder; you have to rely on the 2.5 inch, 180-degree-swivel colour LCD. The downside to this is that shooting with high ambient light is a problem.

There are four recording modes: you can record up to seven hours of video in Fine mode and up to 24 hours in Eco mode, thus ensuring you won't miss a moment of your vacation. Since you record to a hard drive, you can easily delete unwanted scenes and rearrange the footage on the go!

The 25x optical zoom is more than enough for any occasion. But despite the superb image stabilising mechanism, you will require a tripod to shoot video at that magnification. The Tele Macro feature allows you to shoot from as close as 5 cm.



Rating

Company **MCC Group**  
Price **Rs 46,900**  
Phone **011-26102975**  
E-mail [mccops@vsnl.net](mailto:mccops@vsnl.net)  
Web site [www.jvc.com](http://www.jvc.com)

Using the AV input, the Everio turns into a VCR, allowing you to connect to older analogue sources and convert your old memories to digital format. Computer connectivity is via USB 2.0. The camera is also a VGA digital still camera. Photos can be stored either on the hard drive or on an SD card using the SD card slot. The PictBridge and DPOF standards are also supported. An S-Video out is provided to view captured video on a TV in normal or 16:10 aspect ratio, and this is made easy by the accompanying remote.

We found the capture quality as good as that of any other DV cam. The GZ-MG20e comes with CyberLink's video editing suite, which complements the camera perfectly. But you've got to remember that the package costs Rs 46,900. Even then, this being possibly the first hard drive-based camera for home use, you can stop worrying about running out of tape!





## A-DATA FP1 USB 2.0

### Secure It!

If you're overly concerned about the security of data on your thumb drive, the A-DATA FP1 USB 2.0 Flash drive is just the device for you. This 512 MB drive has biometric security features as well as password protection.

The core job of securing the data is performed by the utility software that comes with the FP1, without which it is an ordinary USB drive. Install the software, swipe your index finger over the sensor to register your fingerprint, enter a password, and you're ready to store your data. You disconnect the drive using the software. When it's connected to another PC, you are again prompted to swipe your finger, or enter a password. If there's a fingerprint mismatch, the set password overrides the biometric security. The drive is compatible with versions of Windows 2000 SP4 and above.

The A-DATA FP1 USB 2.0 comes for Rs 1,300, which is decent considering the fact that it lets you sleep peacefully—if you're habitually paranoid, that is!

Company **A-DATA Technology Corp**

Price **Rs 1,300**

Phone **886-2-8228 0886 Ext 2811**

E-mail **kathy\_chen@adata.com.tw**

Web site **www.adata.com.tw**

Rating



## ViewSonic G90f

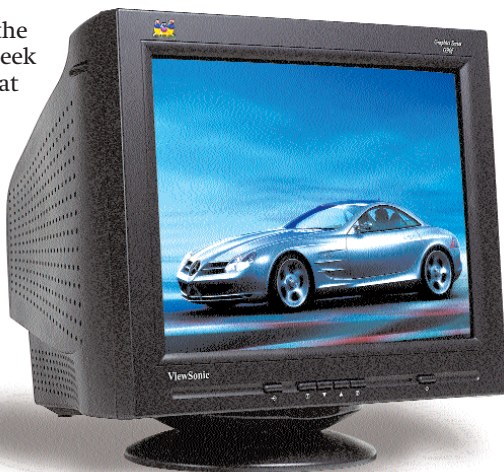
### Truly Flat

The G90f is the latest 19-inch flat screen CRT from ViewSonic, and is aimed at professionals and gamers. In fact, it is a "PerfectFlat," and is supposed to provide terrific precision for video, graphics and engineered imaging. However, we found the image quality not really up to the mark: though the text and graphics looked good enough and the colours vivid, the images lacked the sharpness we expected from ViewSonic—and a PerfectFlat ViewSonic at that.

The viewing area is 18 inches, which is standard for a 19-inch CRT. The G90f has a high bandwidth, and a very high maximum resolution of 1920 x 1440. Also, it can handle 1600 x 1200 at 77 Hz.

The OSD appears pretty dated, but has all the necessary functions.

Though the G90f has a sleek form factor, at 19.2 kg, it's heavy. The price tag—Rs 14,999—is a bit on the higher side, but then, it's a ViewSonic!



Company **Roop Technologies**

Price **Rs 14,999**

Phone **022-26680022**

E-mail **roop@vsnl.com**

Web site **www.viewsonic.com**

Rating

## Plustek OpticSlim M12

### A Portable Performer

Scanners are usually bulky, hence the Plustek OpticSlim M12 is a surprise—weighing a mere 330 grams (only the scanner), the M12 is actually portable. It is an A4 size sheet-feed scanner capable of a hardware resolution of 600 dpi.

Just two buttons adorn the sleek M12, a scan button and a custom button that can be assigned any of a number of functions.

The M12 is decently fast—in our test, it scanned an A4 size photograph in two minutes 15 seconds flat.

Colour reproduction and clarity were good for a scanner of this size.

The greyscale quality was good, too.

The sore point was the

really poor quality of text in black-and-white mode: the M12 took under 20 seconds to scan our document, but the text was barely readable. The only option would be to scan documents in greyscale mode.

The M12 comes bundled with a soft carry case, and can be wall mounted with the bundled kit. It retails at Rs 4,510.



Company **Tel Excell**

Price **Rs 4,510**

Phone **022-23522746**

E-mail **mahendra@telexcell.com**

Web site **www.plustek.com**

Rating

## Digital Tools | A-List

### Motherboards

#### Mercury PI915GVM

- ☑ Supports PCIe, DDR/DDR II RAM, 6-channel audio
- ☐ Only 2 PCI slots. No SATA.

Contact Kobian ECS India Pvt Ltd  
Phone 022-23020767 / 774  
E-mail mumbai@kobian.com  
Price Rs 4,750



#### MSI RS480M2-IL

- ☑ PCIe-based, 6-channel audio, supports 4 GB RAM, Socket 939, FireWire port
- ☐ No Gigabit Ethernet

Contact Tirupati Enterprises  
Phone 033-22251192  
E-mail mail@tirupati.net  
Price Rs 4,950



### External DVD-Writers

#### Lite-On LightScribe SHW-16H55

- ☑ Good performance, EZ-DUB
- ☐ No FireWire

Contact Mediatech India Distribution Pvt Ltd  
Phone 022-26361111  
E-mail digit@mediatechindia.com  
Price Rs 6,495

### Internal DVD-Writers

#### Lite-On Super AllWrite SHM-165P6S

- ☑ Good performance, supports all DVD formats
- ☐ None in particular

Contact Mediatech India Distribution Pvt Ltd  
Phone 022-26361111  
E-mail digit@mediatech india.com  
Price Rs 3,085



### PVR Software

#### WinDVR 3.0

- ☑ Ease of use, pause TV, zoom in on TV, tiled preview of channels, DV-to-MPEG, good picture clarity
- ☐ None

Contact www.intervideo.com

### Cell Phones

#### Sony Ericsson W800i

- ☑ Feature-rich and fast
- ☐ Can do with better colour co-ordination

Contact Sony Ericsson India  
Phone 0124-2560808  
E-mail dhiraj.soni@sonyericsson.com  
Price Rs 24,999



### Graphics Cards (High-End)

#### XXFX GeForce 7800 GTX 256 MB

- ☑ Extreme performance, great price, exotic features
- ☐ None

Contact Rashi Peripherals  
Phone 022-28221013  
E-mail navinderc@rptechindia.com  
Price Rs 32,950



### Linux

#### SuSe 9.3 Linux Professional

- ☑ Up-to-date software bundling
- ☐ None

Contact G T Enterprise  
Phone 080-26695890/91/92/93/94  
E-mail gtdrom@vsnl.com  
Price Rs 4,398



# The A-List



The best products tested so far in different hardware and software categories

### 5.1 Speakers

#### Philips MMS 5.500 i/c

- ☑ Good for music
- ☐ Not suitable for gaming

Contact Philips India Ltd  
Phone 022-56912332  
E-mail pcp.india.info@philips.com  
Price Rs Rs. 4,990

### 2.1 Speakers

#### Altec Lansing MX-5021

- ☑ Great sound and build quality
- ☐ Slightly expensive

Contact Rashi Peripherals  
Phone 022- 55090909  
E-mail info@intextechnologies.com  
Price Rs 7,900



### Hard drive-based MP3 Players

#### Apple iPod

- ☑ Amazing Sound Quality, Easy Interface, Plays Video
- ☐ No FM, No Protection For Screen



Contact Apple Computer International Pvt Ltd  
Phone 1800-425-4683  
E-mail info@intextechnologies.com  
Price Rs 19,800

### Flash-based MP3 Players

- ☑ Good Sound and Interface
- ☐ Very Small Screen For Video Playback

Contact Arihant Computers  
Phone 022-23822424  
E-mail arihant\_computers@vsnl.com  
Price Rs 8,600

### Projectors

#### Sharp XR-10S

- ☑ Brilliant quality and performance
- ☐ Bulky

Contact Sharp Business Systems Ltd  
Phone 011-26431313  
E-mail anilsodhani@sharp-oa.com  
Price Rs 71,000



### LCD Monitors (15-inch)

#### BenQ FP51G

- ☑ Good performance
  - ☐ None in particular
- Contact BenQ India Pvt Ltd  
Phone 022-25705230  
E-mail kamlesh.salunke@benq.com  
Price Rs 9,900

### LCD Monitors (17-inch)

#### NU QL-711V

- ☑ Inexpensive
- ☐ Below average build quality

Contact Shiba Comp Pvt Ltd  
Phone 011-26413437  
E-mail shiba@del2.vsnl.net.in  
Price Rs 11,970

### LCD Monitors (19-inch)

#### NU L921G

- ☑ Low price, good viewing angles
- ☐ Below-average build quality

Contact Shiba Comp Pvt Ltd  
Phone 011-26413437  
E-mail shiba@del2.vanl.net.in  
Price Rs 18,000



**Burning Software**  
**Sonic/Roxio Easy Media Creator 8**

- ☑ Feature-rich, low on system resources, many bundled utilities
  - ☐ None in particular
- Web site [www.roxio.com](http://www.roxio.com)

**Digital Cameras (Mid-Range)**  
**Sony Cyber-Shot DSC-W5**

- ☑ Reproduces some great photographs, good features
- ☐ Relatively expensive in its class

Contact Sony India Pvt Ltd  
Phone 011-55006600  
E-mail [mktginfo@ap.sony.com](mailto:mktginfo@ap.sony.com)  
Price Rs 18,990



**Home Inkjet Printers**  
**Canon Pixma iP1000**

- ☑ Economical, decent photo printing
- ☐ No output tray, no PictBridge

Contact Canon India Ltd  
Phone 0124-5160000  
E-mail [info@canon.co.in](mailto:info@canon.co.in)  
Price Rs 3,195



**Office/Photo Inkjet Printers**  
**Canon Pixma iP 3000**

- ☑ Fast, excellent photo and text printing
- ☐ No LCD

Contact Canon India Ltd  
Phone 0124-5160000  
E-mail [info@canon.co.in](mailto:info@canon.co.in)  
Price Rs 7,495

**Keyboard-Mouse Combos**  
**Gigabyte GKM-10**

- ☑ Good ergonomics
- ☐ Can do with more features

Contact Gigabyte Technology (I) Ltd  
Phone 022-26526696  
E-mail [sales@gigabyte.in](mailto:sales@gigabyte.in)  
Price Rs 790



**Mono Laser Printers**  
**Brother HL-5170DN**

- ☑ Good build quality, network support
- ☐ Expensive

Contact Lipi Data Systems Ltd  
Phone 022-22882960  
E-mail [sharatk@lipidata.com](mailto:sharatk@lipidata.com)  
Price Rs 21,900

**PCs above Rs 25K**  
**Acer Aspire ASP V4324**

- ☑ Good performance and package contents, low price
- ☐ None in particular

Contact Acer India (Pvt) Ltd  
Phone 080-25219520  
E-mail [ailenquiries@acer.co.in](mailto:ailenquiries@acer.co.in)  
Price Rs 25,999

**Media Center PCs**



**HP Pavilion m7280in**

- ☑ Great design, features, and performance
- ☐ Expensive

Contact HP India Sales Pvt Ltd  
Phone 0124-2566111  
E-mail [incontact@hp.com](mailto:incontact@hp.com)  
Price Rs 63,999

**Digital Cameras (Mid-Range)**  
**HP PhotoSmart 945**

- ☑ 8x optical zoom, large lens results in some great photographs
- ☐ Not quite pocketable

Contact J J Mehta and sons  
Phone 022-24326865  
E-mail [sales@jjmehta.com](mailto:sales@jjmehta.com)  
Price Rs 16,500

**Digital Cameras (High-End)**  
**Sony CyberShot DSC-P200**

- ☑ Compact, 7-megapixel performance-oriented camera
- ☐ None in particular

Contact Sony India Pvt Ltd  
Phone 011-55006600  
E-mail [mktginfo@ap.sony.com](mailto:mktginfo@ap.sony.com)  
Price Rs 20,990



**Keyboards**  
**iBall Power Key Designer**

- ☑ Feature-rich
- ☐ None in particular

Contact Best IT World (India) Pvt Ltd  
Phone 022-3081 5100  
E-mail [sales@iball.co.in](mailto:sales@iball.co.in)  
Price Rs 990



**Mice**  
**Logitech G7 laser mouse**

- ☑ Feature-rich, offers fantastic performance
- ☐ Expensive

Contact Logitech Electronic India Pvt Ltd  
Phone 022-26571160  
E-mail [kavita\\_nath@ap.logitech.com](mailto:kavita_nath@ap.logitech.com)  
Price Rs 6,495

**Mono Laser MFDs**  
**Samsung SCX-4521F**

- ☑ Good performance and quality
- ☐ Low input tray capacity

Contact Samsung India Electronics Pvt Ltd  
Phone 011-26431313  
E-mail [vikram.negi@samsung.com](mailto:vikram.negi@samsung.com)  
Price Rs 21,990



**Value PCs**  
**HCL Ezeebee 4981**

- ☑ Great performance and upgradable
- ☐ None in particular

Contact HCL Infosystems Ltd  
Phone 0120-2520977  
E-mail [wecare4u@hcl.in](mailto:wecare4u@hcl.in)  
Price Rs 23,999

**Lifestyle Ultra-Portable Laptops**  
**Sony VAIO VGN-S46GP/S**

- ☑ Good looks, great performance, excellent LCD display
- ☐ None in particular

Contact Sony India Pvt Ltd  
Phone 011-55006600  
E-mail [mktginfo@ap.sony.com](mailto:mktginfo@ap.sony.com)  
Price Rs 99,990

**Lifestyle Workhorse Laptops**  
**Acer Ferrari 4002**

- ☑ Great looks and flaunt value, great performance
- ☐ None in particular

Contact Acer India (Pvt) Ltd  
Phone 080-25219520  
E-mail [ailenquiries@acer.co.in](mailto:ailenquiries@acer.co.in)  
Price Rs 99,999



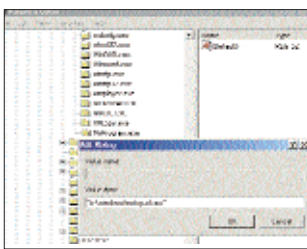
## Windows XP Registry Tweaks

**Warning:** Tinkering with the Windows Registry isn't for the weak-hearted. Goofing off in this area can cause serious problems with your PC, so proceed with caution. We suggest turning on System Restore so that you can revert to the system state that existed before you did anything to the Registry.

### Creating Program Aliases

Wouldn't you just love being able to start programs by just going to the Start > Run dialog and typing in the name? Here's how to do it:

1. Start the Registry Editor (Start > Run > "regedit")
2. Navigate to HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\App Paths and expand the tree—you'll find a lot of entries for different .exe files.
3. Right-click on App Paths and select New > Key and give it a name—MyProgram.exe, for example
4. Select this value, and in the right-hand pane, double-click on the "Default" value. Under Value Data, enter the path of the program—"c:\windows\notepad.exe",



for example

Now, when you go to Start > Run and type "MyProgram", the program you selected will come up.

### Disable the expanding "New" menu in IE

Here's how you can change the File > New menu in IE and replace it with File > New Window.

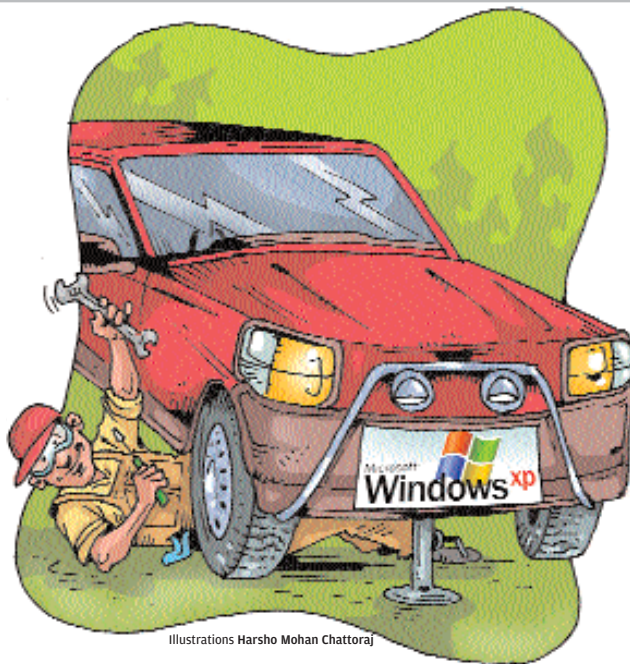
1. Start the Registry Editor

# Tips & Tricks

SECRETS THAT KEEP YOU AHEAD IN THE RACE

GENERAL TIPS		30 MINUTES EXPERT	
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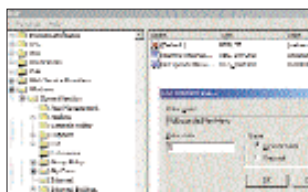
## REGISTRY TWEAKS



Illustrations Harsho Mohan Chatteraj

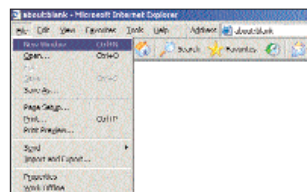
(Start > Run > "regedit")

2. Navigate to HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer
3. In the right-hand pane,



Set the DWORD value to 1

- create a new DWORD (Right-click > New > DWORD Value) and call it "NoExpandedNewMenu"
4. Double-click on this DWORD and set the Value



IE's new look!

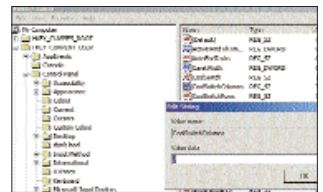
Data to 1

Your Internet Explorer should now show you only New Window under the File menu. You can always revert this setting by setting the value of the DWORD to 0.

### Configure the [Alt] + [Tab] CoolSwitch

You can use the Registry to tweak the appearance of the CoolSwitch dialog that you see when you use [Alt] + [Tab] to switch between applications.

1. Start the Registry Editor (Start > Run > "regedit")
2. Navigate to HKEY\_CURRENT\_USER\Control Panel\Desktop
3. To enable or disable task switching altogether, modify the CoolSwitch value and set it to 1 or 0 respectively
4. To alter the appearance of the CoolSwitch dialog, modify the values of



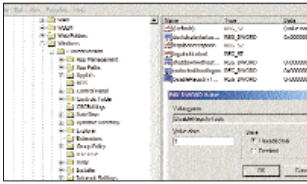
Configuring the appearance of CoolSwitch

CoolSwitchColumns and CoolSwitchRows

### Block Registry Tools

**Warning:** This tip blocks the Registry editing tools for *everyone*—Administrator included—so only use this if you're extremely paranoid about someone altering your registry. You will need third-party registry editors to get yourself out of this one.

1. Start the Registry Editor (Start > Run > "regedit")
2. Navigate to HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System
3. In the right-hand pane, create a new DWORD value (Right-click > New > DWORD) and call it "DisableRegistryTools"
4. Double-click the DWORD and set the Value Data to 1
5. Restart Windows



**Disable Registry Tools**

Remember, only Microsoft's inbuilt Registry tools (yes, regedit included) are blocked by this tweak. To change this back to the way it was, use a third-party Registry editor to change the value back to 0.

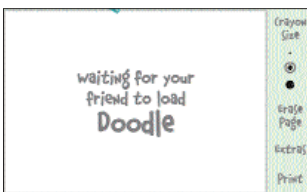
**Yahoo! Messenger**

**Be a Stalker—I**

If you're worried that someone is avoiding you by either signing in as invisible or by changing their stealth setting so that they appear offline to you, here are three simple ways to check.

The first way is to use the Doodle IMVironment. Start an offline conversation with the contact and send them a dummy message. If they're actually online, this should open a conversation window on their machine.

Now, select the Doodle IMVironment from IMVironments > See All IMVironments > Yahoo Tools. If your contact is really offline, you'll see "Waiting for your friend to load Doodle" for a really long time. If, however, your contact is online, the



**Loading doodle** This is what you will see for a really long time if the contact is offline

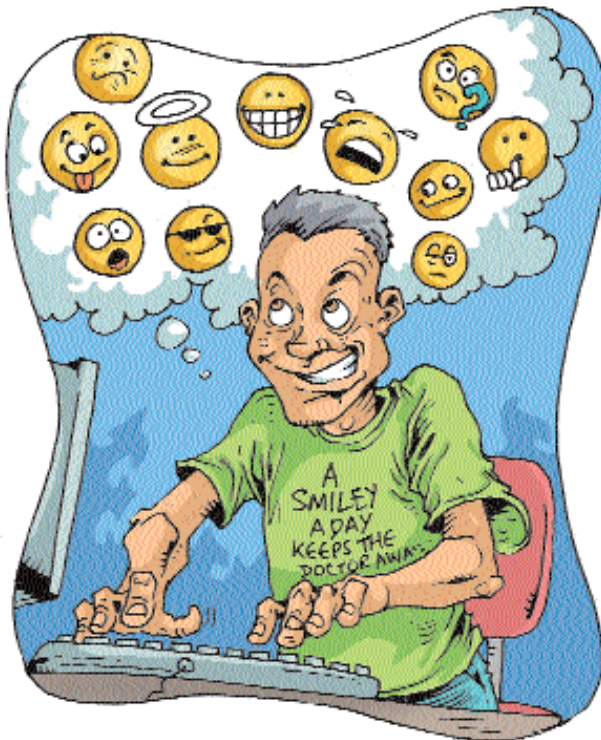
IMVironment should load in less than a minute and let you draw. Ta-da! Now you can satisfy your inner stalker once again.

**For the Victims:**

If you're being annoyed by someone who's using the above method, you could:

1. Add them to your ignore list, or

**INSTANT MESSENGERS**



2. Disable IMVironments by going to **Connection > Preferences** and uncheck the "Enable IMVironments" box under Messages.

**Be a Stalker—II and III**

These methods are quite basic and may not necessarily always work.

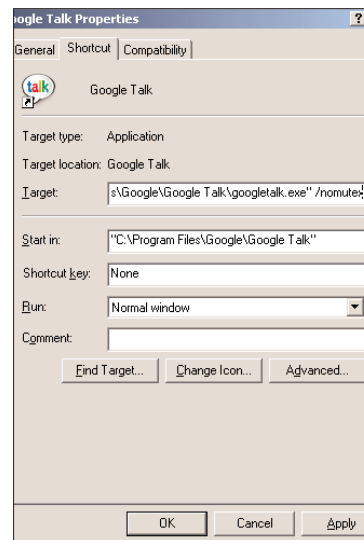
Try to start a voice conversation with the contact. If the person is really offline, you will be asked to leave a voicemail after the ringing times out. If the person is invisible, all you'll get is a "No Answer" message.

Another way is to invite the person to a conference. If the contact is offline, you'll soon get an error message saying "Conference could not be started". If the contact is online, your conference room will just sit empty till your contact either explicitly declines your invitation or if they finally relent and accept.

**Google Talk**

1. **Run Google Talk with multiple e-mail addresses at the same time** if you've got many Gmail

accounts and don't want to keep logging on and off them every time you want to switch, a simple command line parameter in the Google Talk shortcut can solve your problem. First, create one copy of the Google Talk shortcut on your desktop—leave the original intact. Right-click on this shortcut and select Properties. The Target text box will show you the path of the EXE for



The Google Talk shortcut Properties dialog

Google Talk—something like "C:\Program Files\Google\Google Talk\googletalk.exe"

Change this to "C:\Program Files\Google\Google Talk\googletalk.exe" /nomutex and click OK. You will now be able to run multiple instances of Google Talk with different identities for each.

**Other Command line parameters for Google Talk**

Just like you added the /nomutex parameter to the Google Talk shortcut, you can use the following parameters for other purposes:

- /register: writes Google Talk's settings to the Windows Registry
- /checkupdate: checks for new versions of Google Talk
- /factoryreset: reverts to the original settings
- /mailto email@gmail.com: sends an e-mail through Gmail
- /diag: starts Google Talk in diagnostic mode

**Google Talk Keyboard Shortcuts**

Here are some quick shortcuts to use with Google Talk:

- [Ctrl] + [E]—Centre-align text in the chat window
- [Ctrl] + [R]—Right-align text in the chat window
- [Ctrl] + [L]—Left-align text in the chat window
- [Ctrl] + [I] or [Tab]—Cycle through windows
- [Ctrl] + [Tab] or [Shift] + [Tab]—Cycle through windows in reverse order
- [Ctrl] + [1]—Type single-spaced lines
- [Ctrl] + [2]—Type double-spaced lines
- [Ctrl] + [5]—Type 1.5-spaced lines
- [Ctrl] + [1] (Numeric Keypad)—Go to the end of the last line
- [Ctrl] + [7] (Numeric Keypad)—Go to the beginning of the first line
- [Alt] + [Esc]—Close all Google Talk windows
- [F9]—Send an e-mail to

## MSN Messenger 7.5 Error Codes

Code	Message	Possible Solution
80048883	Signing in to MSN Messenger failed because the service is temporarily unavailable. Please try again later.	If you are using MSN Messenger 7.5, try this: “ Download this file: <a href="http://clientconfig.passport.net/ppcrlconfig.bin">http://clientconfig.passport.net/ppcrlconfig.bin</a> “ Rename it to ppcrlconfig.dll “ Drop it in C:\Documents and Settings\ <your id="" user="">\Application Data\Microsoft\IdentityCRL\            “ Try Again</your>
80004005	Signing in to MSN Messenger failed because the service is temporarily unavailable. Please try again later.	This effectively means “Something is wrong but we don’t know what.” Try reinstalling MSN Messenger and see if it will work. This could be a problem with the MSN servers; check the MSN
80048820 80048848	Sorry, we were unable to sign you in to the MSN Messenger at this time. Please try again later. To let us try and troubleshoot the problem, click the Troubleshoot button.	Messenger status page ( <a href="http://messenger.msn.com/status.aspx">http://messenger.msn.com/status.aspx</a> ) to see if problems have been reported. If this is the case, all you can do is wait.
80072ee7	We were unable to sign you in to the MSN Messenger, possibly because of a problem with your Internet connection. Please try again later. To let us try and troubleshoot the problem, click the Troubleshoot button.	You are either not connected to the Internet or your firewall is blocking MSN Messenger. Add MSN Messenger to the list of permitted programs.
80070190 80070193 800701f7 80072efd 80072eff	Signing in to .NET Messenger Service failed because the service is temporarily unavailable. Please try again later. 80070190 Click the help button to check the current service status.	Check the MSN Messenger status page to see if there is a problem with the messenger servers. If the service isn’t running, you’ll have to wait.
8007277b	Sorry, we were unable to sign you in to the .NET Messenger Service at this time. Please try again later. 8007277b	This is usually caused by content filtering software such as CyberSitter. Disable the software and try again.
80072f0d	There was a problem connecting you to MSN Messenger. 80072f0d	This might be a problem with the security components of MSN Messenger. Close Messenger and go to <a href="http://www.passport.net">www.passport.net</a> using your browser. Click on the “Sign In” button and you should get a Certificate dialog. Accept the certificate, and try again. If you did not get the certificate dialog and MSN Messenger still does not work, open the advanced settings dialog in Internet Explorer by clicking on the Tools > Internet options menu and go to the Advanced tab. Go down to the security section and make sure “Use SSL 2.0” and “Use SSL 3.0” are both checked. MSN Messenger requires SSL for the authentication process.
80090305	Signing in to MSN Messenger failed because the service is temporarily unavailable. Please try again later. 80090305	Try re-installing Internet Explorer.

the current contact  
 [F11]—Start a phone call with the current contact  
 [F12]—Cancel the phone call  
 [Esc]—Close the current window

### Formatting text in Google Talk

Unnoticed by most, Google Talk lets you do a little basic formatting with your text. To type in bold, enclose the text within asterisks (\*hi\* = **hi**), and to type in italics, enclose the text within underscores (\_hi\_ = *hi*). You won’t see the result while you’re typing—only after you hit [Enter] to send the message.

## MSN Messenger

### Nudgebomb!

**Note: This will only work in MSN Messenger version 7.0.**

Ever wanted to annoy someone to the brink of insanity? Nudgebomb them! Just set your status to Busy, and nudge away! MSN Messenger 7.0 allows you to

send nudges as often as you want in this status. The Nudge button is located just above the Send button.

This has been rectified in version 7.5, so if you want to be a pain in someone’s nether regions, don’t upgrade.

### A “Chat With Me” link on your Web site

With the coming of MSN Messenger 7.5, you can now put up links on your blog or personal Web site that will let people instantly add you to their Contact List or chat with you (as long as they’re using Internet Explorer). All you need is a little HTML code.

To let people add you to their contact list, use this:

```
<a href="msnim:add?contact=email@address.com">Add me to your MSN Messenger contact list</a>
```

To let people start a chat with you, use this:

```
<a href="msnim:chat?contact=email@address.com">Click here to chat with
```



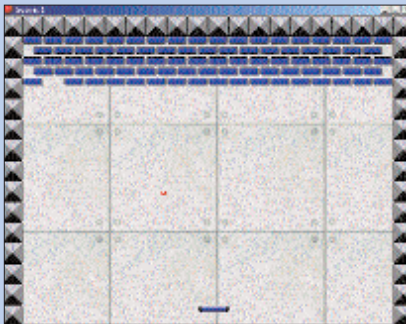


# Create A Game Yourself!

Remember good old *Arkanoid*? Now you can create your own using Game Maker from this month's *Digit* CD!

Nimish Chandiramani

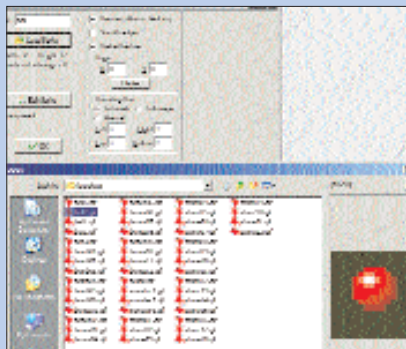
If you've just read the article about young Shashank H R, you're probably itching to get started on a game of your own. Here, we'll create a simple, one-level version of that ever-loved classic, *Arkanoid*.



## STEP 1 The Cast

After you've installed Game Maker from the *Digit* CD and fired it up, the first step is to add all the sprites you're going to use. Sprites are just images that will play different roles in the game. For this game, we'll need a bat, a ball, a wall and a brick. Select **Add > Add Sprite** and click on the **Load Sprite** button in the dialog. Game Maker comes bundled with a load of example sprites, so you don't have to hassle yourself making your own. Find the sprites here:

**Ball:** <Drive>:\Program Files\Game\_Maker6\Sprites\various (pick any of the Ball icons from here)  
**Bat:** <Drive>:\Program Files\Game\_Maker6\Sprites\breakout\bat1.gif



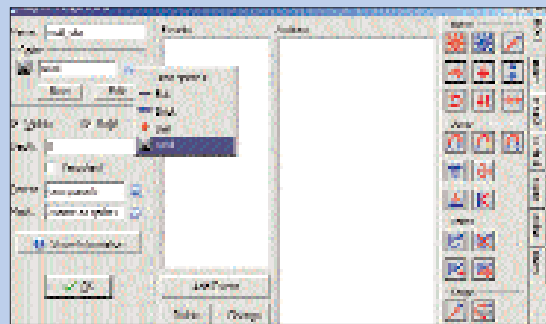
Select a ball from the game's many samples

**Brick:** <Drive>:\Program Files\Game\_Maker6\Sprites\breakout\stone01.gif  
**Wall:** <Drive>:\Program Files\Game\_Maker6\Sprites\pacman\wall.gif

Make sure you name the sprites appropriately.

## STEP 2 Walls And Bricks

Just loading sprites isn't enough—you need to turn them into objects to make them interact with each other in the game. We'll start by creating an object for the wall. Go to **Add > Add**



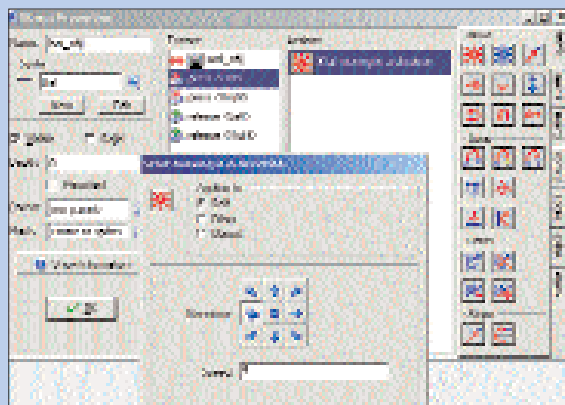
Creating the Wall object

**Object.** Call the object "wall\_obj" and click on the button under "Sprite" to choose the Wall sprite. This is going to be a solid object, so check the **Solid** checkbox.

Repeat the same procedure and create an object for the Brick as well.

## STEP 3 The Bat

We'll do more in the **Add Object** dialog this time. Once we've added a Bat object (the way we



Setting up the Bat



The Event selector

did for the wall), we need to define what it's going to do in the game:

(a) Move left when we press the left arrow; ditto for the right

(b) Stop when it touches the wall

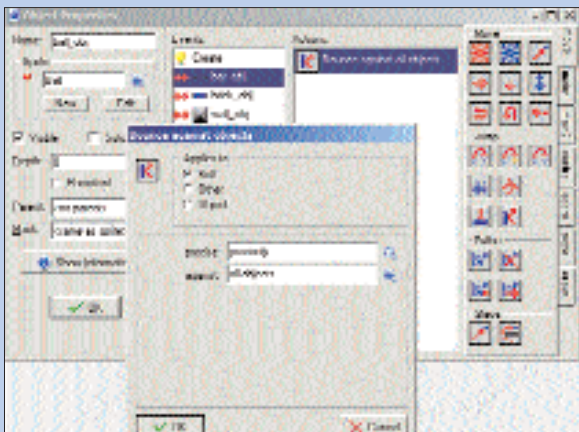
For the first requirement, we'll create a **Key Press** event that tells the bat to move when one of the arrow keys is pressed. Click on the **Add Event** button and in the **Event selector** that comes up, click on **Key Press** and choose **Left**. From the **Move** panel on the left, drag the "Start Moving in a Direction" icon (the red one with arrows in all directions) into the **Actions** region. In the dialog that comes up, depress the left arrow and set the speed to 5. Repeat this for a **Right** key press event.

We also need to stop the bat when the arrow keys are released, so repeat the same procedure for **Key Release** events for the left and right arrows, this time setting the speed to 0.

Finally, we also need to stop the bat when it touches the wall. Add a **Collision** event, and select the **Wall** object. Again, drag the **Start Moving in a Direction** icon and choose a speed of 0.

## STEP 4 The Ball

The ball is the heart of the game, and we'll be creating lots of events here. The first thing we want it to do is move in a random



Setting up collisions for the Ball

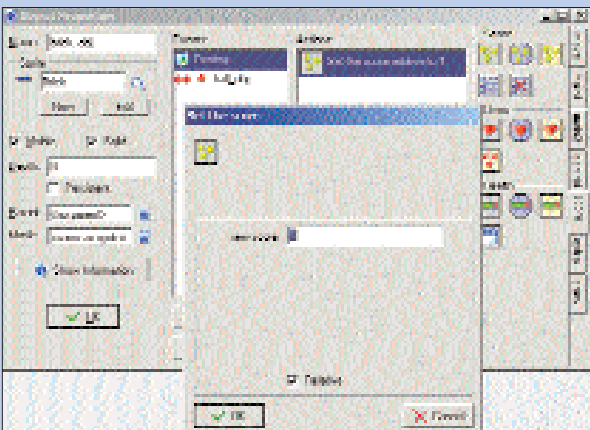
direction when the game starts. To do this, add a Create event and drag the Start Moving in a Direction icon into the Actions region. Depress all three arrows at the top to make it choose a random upward direction. Set the speed to "8".

The next thing we need to do is create a collision even for the bat. The ball is supposed to bounce off it, so drag the "Bounce Against Objects" button from the Jump panel on the right. In the dialog that comes up, select "Precisely" and "Against All Objects". Do the same for the brick and the wall, but choose "Against Solid Objects" this time.

You're supposed to lose the ball if you miss it, so we'll delete it if it leaves the room. From the Event Selector, choose Other, and select Outside Room. Select the "main1" tab from the right and from under the Objects panel, drag the Destroy the Instance icon (the one that looks like the Windows Recycle Bin) into the Actions region.

### 5 STEP Back To The Bricks

Edit the Brick object again and add a collision event



Adding points to Bricks

with the Ball object. Just like you did for the ball, create a "Destroy the Instance" Action for the brick. Finally, we'll add a score point every time a brick is destroyed. To do this, add a Destroy event, and from the Score tab on the right, drag the Set the Score icon (the first one) to the Actions region. In the dialog, enter the

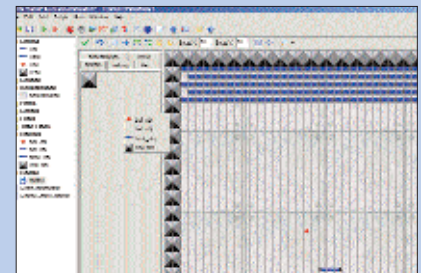
points you want to add after each brick is destroyed and make sure you choose Relative so that scores are added and not just assigned.

### 6 STEP More Balls!

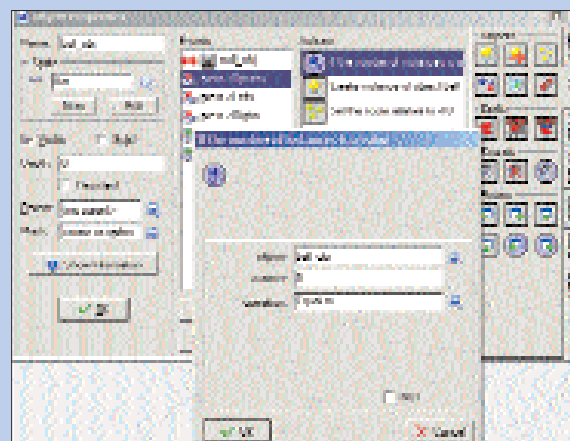
We've created an event where the ball will be destroyed if missed, but we also need to create a new ball each time. You could create the ball automatically, or wait for the player to hit a key. We'll do the

the "If the number of instances is a value" icon from the Questions panel. In the dialog, choose the ball object as the object you want to check, the number is 0, and the operation is Equal to.

If there aren't any balls in the room, we'll create a new one, and also pile on a score penalty of 10 points for needing to create one. To create a new ball, select the Create Instance of Object icon from the "main1" tab and choose the ball object in the dialog. Finally, add a Set the Score action to this, set the score to "-10" and choose Relative.



Placing objects in the Room



Checking the number of Balls in the Room

### 7 STEP The Room

Now that we've set up the game's rules and the objects' behaviours, we need to create a room for all this to happen.

Go to Add > Add Room to add one. In the Room Properties dialog, you can place all the sprites where you want them. Click inside the Objects panel to select the object you are going to place in the room. Click in

the room layout to place the object. Start with the wall object and place them along all but the bottom edge of the room. To remove an object from the room, right-click on it. Do the same for the bricks, the ball and the bat.

You're done! Run the game by clicking on the Play icon on the toolbar. This is, of course, nowhere near as complex as the original Arkanoid—you can add a lot more: special bricks, power-ups, monsters... anything you like. You can also create new levels (rooms) and rules for the game. Go wild! ■

latter here, but the procedure remains the same—you just need to know which event to assign the action to.

Edit the bat object—add another Key Press event for the space bar. We're first going to see if the previous ball has indeed been destroyed—there should be 0 balls in the room. Select the Control tab on the right and choose

the room layout to place the object. Start with the wall object and place them along all but the bottom edge of the room. To remove an object from the room, right-click on it. Do the same for the bricks, the ball and the bat.

You're done! Run the game by clicking on the Play icon on the toolbar. This is, of course, nowhere near as complex as the original Arkanoid—you can add a lot more: special bricks, power-ups, monsters... anything you like. You can also create new levels (rooms) and rules for the game. Go wild! ■

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## LINUX



### Keyboard Tricks Using [Tab]

All the Unix commands and the contents of the current directory are known to BASH (the Bourne Again SHell), so you don't need to type all the characters of a command or path. Just type in the first few and hit [Tab]—this will auto-complete the command for you. If you hear a beep, it doesn't mean an error: there's just more than one option with the same starting characters. Press [Tab] again to see a list of all the commands that begin with the characters you keyed in. The same applies to auto-completing a filename or path.

Say you want to switch from `/root` to `/usr/local/mystuff/videos`. This is how you use [Tab] in this case:

```
$cd /us [Tab]
```

auto-completes as: `/usr`.

Now continue without pressing [Enter]:

```
$cd /usr/loc [Tab]
```

This auto-completes as: `/usr/local`.

Now, `$cd /usr/local/my[Tab]` auto-completes as `/usr/local/my\stuff/`. Do not press [Enter] yet! We've deliberately included a space in the final folder name so as to demonstrate the importance or the usefulness of the [Tab] key when dealing with folder names containing spaces.

```
$cd /usr/local/my\ stuff/[Tab]
```

As shown above, the space in a folder or file name is preceded with a backslash; it informs the shell of the space. Otherwise, the shell will consider it as two

separate files, "my" and "stuff."

If "my stuff" only contains one folder—as in our case, "videos"—then [Tab] will complete the path even if you don't type in any characters, since it is the obvious choice. The desired path using the auto-complete technique will appear as

```
$cd /usr/local/my\stuff/videos
```

You can now press [Enter] to change to that directory. This technique can be applied to almost everything except with the "man" command.

### Using [Ctrl] + [R]

Commands are sometimes called over and over again, perhaps with minor changes. Retyping them again and again even with the advantage of the auto-complete feature using [Tab] can be frustrating, especially if the command including its parameters is long. It also tests your memory! For example, the "cdrecord" command is very long, considering all the parameters involved. This is where the history of commands stored by BASH comes in handy.

To recall a command without having to remember and retype, press [Ctrl] + [R] and type the first few characters of the command. To see the various options you've used earlier with the command, press [Ctrl] + [R] over and over again until you find the command combination you're looking for. Pressing [Enter] will result in the execution of the chosen command. If any changes are to be made to the command, then hit [Tab] instead—this will display the command as if you just entered it.

As an example, when you press [Ctrl] + [R], the shell prompt changes to

```
(reverse-i-search)`':
```

Key in the first few characters of your command, say, "tar -". When you do this, BASH displays a few commands you had entered earlier, as in

```
(reverse-i-search)`tar -':
```

```
tar -jxvf MPlayer-1.0pre7.tar.bz2
```

If the displayed command is not the one you're looking for, hit [Ctrl] + [R] again. It will display the next choice from the history of commands. Repeat this until it displays the one you are looking for. Say you're looking for "tar -C /usr/...". We shall repeat [Ctrl] + [R] until we get:

```
(reverse-i-search)`tar -':  
tar -C /usr/more-apps/ -jxvf  
vlc-0.8.4a.tar.bz2
```

When the above line gets displayed, use [Tab] to bring it to the shell prompt, if any editing is to be made to the command; otherwise, hit [Enter] to directly execute the command.

### Mount-Script

If you dual-boot Linux and Windows, you're likely to mount the Windows partition every now and then. Although some of the new distributions provide the option of mounting Windows partitions at startup, you might still want to keep control to yourself.

To have good control over the mounting of a partition, you need to be aware of the device name of a partition, such as `/dev/hda5` (a Windows FAT32 partition on our machine, also known as the E: drive) and a mount point for it (say `/mnt/win/E`). This is explained in the following.

To see the list of all the partitions on your hard disk, use the command "fdisk -l". Note down the device name of the your Windows drives; you need to mount these partitions to a predefined folder, called the "mount point." Create a folder called "win" under `/mnt`, and then create folders under "win" for the partitions you want to mount. We used the drive letters (C, D, and E) as the names for the mount points. When mounted, the Windows partitions would appear under `/mnt/win/C`, `/mnt/win/D`, and `/mnt/win/E`.

To mount your Windows D drive, say, you will have to issue the command

```
mount /dev/hdaX
```

`/mnt/win/D` where the "X" in "hdaX" stands for the partition number corresponding to the Windows D drive. You will have to repeat the command for all the partitions and at every boot. You'll soon find this a tedious task!

**Simplify it:** use just one command. Create shell scripts for mounting and un-mounting the partitions.

Assuming you're using `konsole` or `gnome-terminal`, create a file using the vi editor as follows:

```
#vi win-mount [Enter]
```

This creates a file with the name "win-mount", but it isn't saved yet. Press [Insert] to switch to the text editing mode of vi. Enter the following commands one below the other in the vi editor:

```
mount /dev/hdb1  
/mnt/win/C  
mount /dev/hdb5  
/mnt/win/D  
mount /dev/hdb6  
/mnt/win/E
```

Save the file by first hitting [Esc] to exit from the typing/editing mode, then key in ":" (a colon) followed with "wq", which means save and exit.

Create another file in the same fashion to un-mount the mounted partitions. Only the file name (use "vi win-unmount") and the set of commands will undergo a few changes. The command will change to:

```
umount /mnt/win/C  
umount /mnt/win/D  
umount /mnt/win/E
```

Save and exit the file. The last step is to change this text file to a shell script. To achieve this, issue the following command:

```
#chmod 700 win-mount  
win-unmount [Enter]
```

Both the text files will now have shell script permissions. Whenever you want to mount the Windows partitions, change to the directory containing the script and issue

```
./win-mount [Enter]
```

To un-mount the partitions before shutdown or whenever you want to, change to the directory



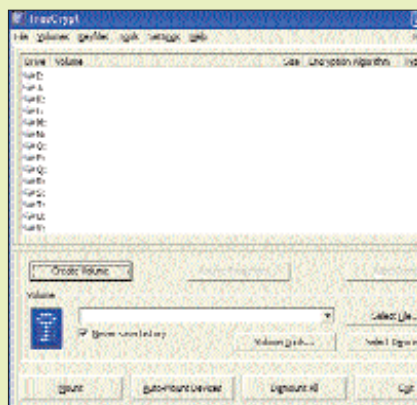
# Encrypt Your USB Drive

USB drives are like keychains—they can easily be misplaced. You don't want your data in the wrong hands, so encrypt it and spoil the thief's party

Sanket Naik

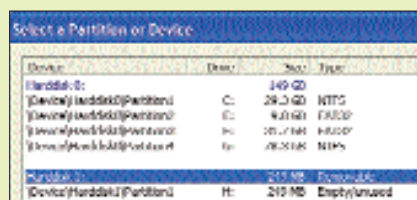
Here we will see how to encrypt a USB drive using TrueCrypt, a freeware tool. TrueCrypt is fast because it does encryption on the fly.

**1 Download And Install**  
 Download the utility from [www.truecrypt.org/downloads.php](http://www.truecrypt.org/downloads.php). Unpack it and install it. The main interface is shown below. It looks sparse, but it's got everything you'll need.



TrueCrypt's user interface

**2 Select What To Encrypt**  
 First we need to create a volume. On the main screen, hit the Create volume button and follow on to the next screen. Here, select Create Standard TrueCrypt volume and click Next. Once done,



Select whether to encrypt a Drive or a Device

you will get an option to create an encrypted Drive or Device—select Device. TrueCrypt allows for the creation of a volume on your hard drive, and it can completely encrypt a hard drive partition or a USB device. Since we are here encrypting a USB device, we selected Device in this step.

**3 Select Your Drive**  
 Once Device is selected, a small window opens, listing all the partitions on your hard drive. This will also list any removable



The digital levers that help safeguard your data

drives. Select the drive you want to encrypt and click Next—in our case, this will be the removable drive.

**4 The Actual Encryption**  
 This step deals with selecting the encryption and hash algorithms. We would suggest leaving this to the defaults if you are not sure. The default encryption algorithm is AES, which is an industry-wide standard, and reliable enough for most purposes. The hash algorithm used is RIPEMD-160. The drop-down menu lists many encryption algorithms and hash algorithms. A detailed explanation



Enter the key combination

about each is given in the Help file—we suggest you read it if you'd like to be in a position to be able to tweak the settings.

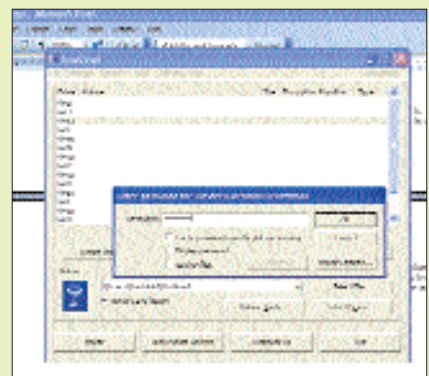
**5 The All-Important Password**  
 Here, the software will prompt you for a password, up to 20 characters in length. If you're encrypting critical data, we



The countdown before the lockdown

recommend you use at least an eight- or 10-character password for safety. Key in the password and then re-type it to confirm.

**6 Formatting Your Device**  
 The final step is to format the device. Here, you can select the desired file system and cluster



Enter your key combination to unlock your vault

size. Before clicking on Format, move the mouse at random for about thirty seconds to create a good encryption key.

**7 Use It!**  
 Once an encrypted volume is created, it needs to be mounted before you can access it. To mount the drive, open TrueCrypt and select any drive letter from the window, in our case, K. Then click on the Select Device button and select the encrypted volume (the USB drive). You will be prompted to provide the volume password; key in the password and the drive will be mounted. Once mounted, the drive can be accessed just like any other partition, and you'll be able to read from and write to it. ■

[sanket\\_naik@thinkdigit.com](mailto:sanket_naik@thinkdigit.com)

containing the script and issue:

`#./win-umount [Enter]`

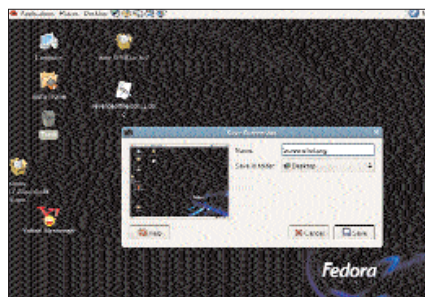
It will be easier to use the scripts if they are located in the user's Home directory, since the konsole or the terminal opens in that location by default.

### Taking A Screenshot On A Linux Machine

There is no fixed method of taking a screenshot in Linux. That means a method used to take a screenshot in Gnome is not applicable for KDE. Here, we look at the different methods of taking screenshots—the Gnome method, the KDE method and the Gimp method.

#### Gnome Method

It is very easy to take screenshots in the Gnome environment. Just press the [Print Screen] button; the "Save Screenshot" dialog box displaying a screen capture will pop up. This image can be saved only in the PNG format. By default, the save location is the current user's Desktop. You can choose to save it in the Home folder of



Taking a screenshot in a Gnome desktop environment is easier than in Windows

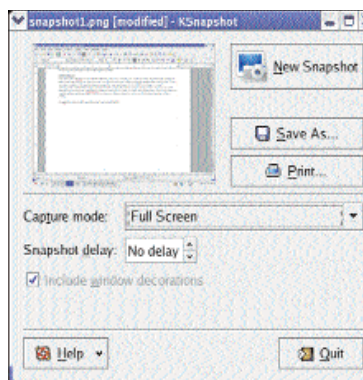
the current user, or choose Other to save it to a specific location. Also, pressing [Alt] along with [Print Screen] will result in an image capture of the active window and not the whole screen.

#### KDE Method

Try using [Print Screen] key in KDE. You'll soon find that nothing happens. Well, KDE doesn't have this feature! You'll need to install a KDE package called kdeggraphics3 if it's not already installed. Normally, the package is a part of all KDE desktops in

most distributions—so all you need to do is verify that it exists. Open the Run Command dialog box, type in "ksnapshot" and hit [Enter]. If that fails to open the application, you need to download the package, else choose the Gnome or the Gimp method for taking a screenshot.

If Ksnapshot opens, it displays a preview of a



ksnapshot will allow you to take screenshots in KDE

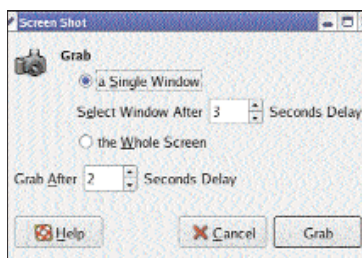
screenshot. You can choose to take a New Screenshot, and perhaps choose a Capture Mode from amongst "Full Screen", "Window under Cursor", or "Region". You can even set a delay (in seconds) in order to be ready to select a region or a window before the capture is actually done. Unlike Gnome's screenshot method, Ksnapshot supports multiple image formats, so

you can choose to save your screenshot as JPEG, PNG, BMP, etc. Another cool feature of this tool is that it can print a screen capture without having to save the image.

#### GIMP Method

This is perhaps the most "professional" method of taking a screenshot. For one, it works on any desktop environment, and secondly, a high level of image editing is possible in The GIMP.

To take a screenshot, open The GIMP and go to File >



Take a screenshot in the GIMP and then edit it even before you save it

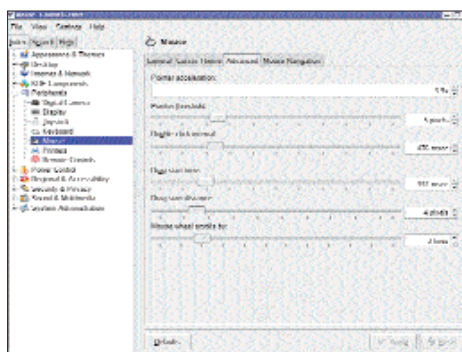
Acquire > Screen Shot. A dialog window pops up, displaying two options—"Grab," or the mode of capture (whether full-screen or single window) and "Grab Delay," or the time in seconds after which the capture will be acquired.

If Single Window is chosen as the Grab mode, two time delays can be set. The first time delay is for choosing which window you want to capture, and the second delay is for the capture itself. It is ideal to keep the former timer to a high value so you have ample time to select a window.

The capture thus taken appears under The GIMP for editing. You can take advantage of this advanced tool for editing or resizing the captured image.

### Altering Mouse Settings In Fedora Core 4

You may want to speed up your mouse pointer acceleration or change a right-



Left-handers can change the mouse settings in Fedora Core 4 to suit their style

handed mouse to left-handed, or change the cursor theme. All the above can be done from Fedora's Control Center.

Assuming you're using KDE, click on the Hat button to open the K Menu. Locate Control Center and click on it. The Control Center dialog box opens, displaying most of your PC's device and OS settings. Choose Mouse by collapsing the Peripherals list. On choosing a device or an

option from the tree on the left, the configuration of the selected device or option appears on the right. For the mouse, the configuration is split into four tabs: General, Cursor Themes, Advanced, and Mouse Navigation.

To change the mouse to left-handed, choose Left-handed from Button order under the General tab. Under the Advanced tab, the first option allows you to increase the mouse pointer speed. Change the Pointer Acceleration from 2.2x to, say, 3.5x or more according to your preference. Other useful settings such as double-click speed (Double Click Interval) and the number of lines scrolled by the mouse wheel (Mouse wheel scrolls by: default 3 lines) can be altered from this tab.

The Mouse Navigation tab allows you to set the mouse pointer to respond to controls through the keys on the numeric keypad. Finer settings such as response time and acceleration can be adjusted on enabling this control.

Finally, if you don't like the pointer scheme, you can choose a different one from the Cursor Theme tab.

Moreover, you can install a new theme from your hard disk, or just paste the

URL from where a theme can be applied. Click on the "Install New Theme..." button to do so. ■

# Q&A

Your Questions, Our Answers

## Of Halves And Sixteenths

**Q** I have a problem with Excel. We manufacture in millimetres, but our customers need measurements in inches. I've used formulas to determine the inches, but when I format a cell for fractions, Excel does not give me the least common denominator. I measure to the level of 1/16 of an inch, but "half an inch" looks like "8/16" in my spreadsheets. How do I get around this?

Inder Kohli

**A** There are many options in the "Fraction" category of Excel's number formatting. It seems to us that you've chosen the "As sixteenths" option. This, taken literally, means every fraction is rounded to the nearest sixteenth, and is then displayed in sixteenths—as in 8/16 instead of 1/2.

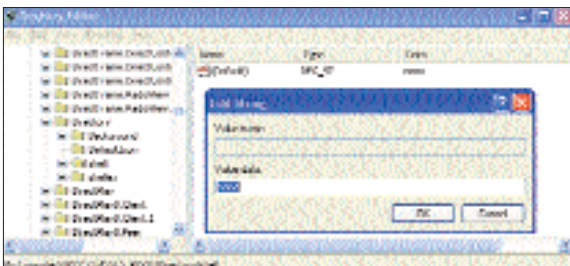
One option is to choose "Up to two digits," in which case you would see 1/2 rather than 8/16. The drawback is that you would also see fractions such as 51/82! You may therefore need to create a new column to display your values in sixteenths. If the base value is in cell A1, the function "=**MROUND**(A1/2.54,0.0625)" would give the value rounded to a sixteenth. After applying the formula, format the cell with "Up to two digits."

## Shoo, Doggie!

**Q** I use Windows XP Professional. Whenever I double-click on any folder in Windows Explorer, the Search Companion pops up. How do I get rid of it?

Prathamesh Mahindre

**A** You will need to edit the Registry to get rid of the Search Companion. But we'd like to warn you that you should proceed only if you're familiar with editing the Registry: one wrong step could render Windows unbootable.



Modify Registry key to open folder on double-click

In the Registry Editor, navigate to "HKEY\_CLASSES\_ROOT\Directory\shell", and locate the "Default" entry in the right pane. Click "Modify" to change the value, and enter "none" in the "File" data box. Click OK and exit the Registry Editor. That should make the little dog go away!

## Squish!

**Q** I have Windows XP installed on my computer—a Pentium 4 2.4 GHz with 512 MB of RAM and an 80 GB hard drive. I have a broadband connection. I suspect that a virus has infected my computer. I find small executable files in each folder with their names as that of the root folder. What can I do?

Kalyani Guhathakur

**A** Your computer has been infected by W32.Traxg@mm, which is a mass-mailing worm that sends itself to all addresses in the Microsoft Outlook address book. This is not a high-risk worm—all it does is send copies of itself to various e-mail recipients. Removal of the worm is very easy—just follow these steps.

1. Install an anti-virus and update the virus definitions from the vendor's Web site.

2. Disable System Restore. To do this, go to **Control Panel > System > System Restore**, and tick the box next to "Turn off System Restore on all drives". Click OK.

3. Restart the computer in Safe Mode.

4. Run a full system scan and delete all the infected files detected during the scan.

5. Open the Registry Editor. Navigate to "HKEY\_LOCAL\_MACHINE\Software\Microsoft\Windows\CurrentVersion\Run". In the right pane, delete "TempCom" = "%WinDir%\Fonts\<randomname>.com", where "randomname" can be any random file name. Exit the Registry Editor and restart the computer in normal mode.

6. You may also want to restore the default settings of Windows Explorer that were changed by the worm. To do this, start Windows Explorer, go to **Tools > Folder Options > View**, and click the Restore Defaults button. Click OK and close Windows Explorer.

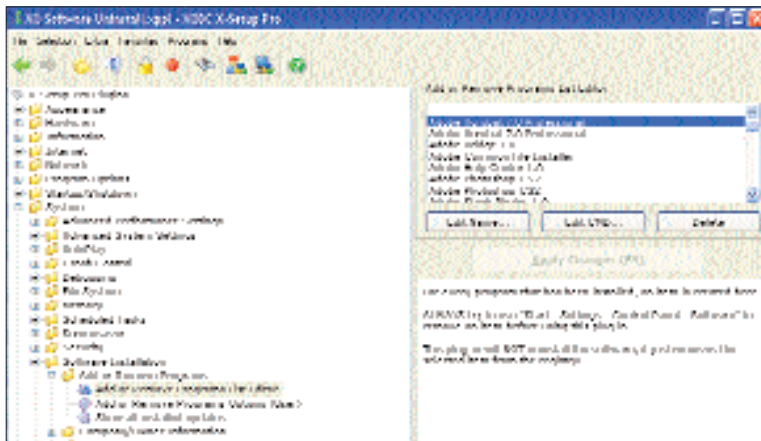
## Seeing Double

**Q** I use Windows XP Home SP1. Add or Remove Programs displays two entries for some programs I've installed. How do I correct this?

Anil Kumar Sahoo

**A** Sometimes, when you uninstall a program and install a higher version, or when you install a newer version of a program over an older version, the entries of the old program are left in the Add or Remove Programs applet. This happens because some programs do not correctly remove the Registry entries of the uninstall string for the program while being uninstalled or upgraded.

To correct this problem, download and install X-Setup Pro from [www.x-setup.net](http://www.x-setup.net). This is a system configuration and tweaking utility. Launch the program and navigate to **System >**



Use XQDC X-Setup Pro to remove the duplicate entries in Add or Remove Programs

Software Installation > Add or Remove Programs, and click on Add or Remove Programs List Editor. In the right-hand side, you can view the entries that appear in the Add or Remove Programs applet. Click on an entry and click Delete to delete it. You can also click on Edit Name or Edit CMD to edit the name of an entry, or to view the uninstall command associated with that entry. Close X-Setup and your problem should go away—no reboot is necessary.

### Selective Trimming

**Q** Often, my temporary Internet files folder gets too large. I'd like to reduce the size of the folder by deleting some of the sites I've visited, but not all. Is there a way to do this?

Varun Tripathi

**A** In IE, go to Tools > Internet Options. In the General tab, you should find a panel in the centre called "Temporary Internet Files." Click Settings in this panel, and a dialog box will appear. Here, click View Files. You'll now be able to see all your cached temporary Internet files. That's precisely what you want—delete whatever you need to.

### To Boot Or Not To Boot, ...

**Q** When I boot up my PC, I get this message: "Primary Hard Disk 1 not found. Push F1 to continue, F2 for setup utility." But when I press [F1], the system boots normally and runs fine. What could be the problem?

Navneet Joshi

**A** There is more than one reason for this to be happening. Your BIOS is set to boot from the non-primary hard disk first. Most BIOSes have settings to re-order device booting, and some of these settings are buggy. The BIOS might not automatically look for the next available bootable device, and that's why the error message pops up. You will have to enter the CMOS setup and set your detected hard drive as the first boot device. Your problem should go away.

Another cause could be that your hard disk is taking some extra time to spin up. If this is happening, the system—which could be trying to boot fast—might not see the disk. You can fix this in the BIOS: usually, there's a setting called "Hard Drive Pre Delay" or "Hard Drive Pre-Boot Delay." Set this for a reasonable time such as 10 seconds to allow the disk to spin up.

### All Spaced Out

**Q** Double-spacing is required for my essays in MS Word. I'm using Word 2003. How do I configure it to automatically double-space?

Prakash Pundit

**A** This is quite simple. Open a new document, and go to Format > Styles and Formatting. Look for "Normal" at the right of the Styles and Formatting panel, and select it. Click the arrow next to Normal and select Modify. Click Format at the bottom left of the Modify Style dialog box, and choose Paragraph. Now look for the Line Spacing setting and make your changes—from Single to Double. Now in the Modify Style dialog, select the Add to Template checkbox, and click OK.

### A Question Of Credentials

**Q** When I try to schedule a new task in the Task Manager, I get an error saying that the new task has been created but that it might not run because the account information could not be set. Task Manager reports error 0x80070005: "Access is denied." It says to use the Browse button to locate the application. What do I do?

Mahesh Verekar

**A** When you schedule a new task, you need to give it the account name and password under which it will run. This ensures that the task can run even when a different user—or no user—is logged on. Remember that for scheduling a new task, you need to use an account for which a password has been defined: it's when you try to use an account that has no password, or if you omit the password, that you'll get the error you described.

If the account and password are fine, the problem could be with Windows. Microsoft has acknowledged a problem in XP SP2 that can result in this problem. They will release a hotfix for this. In the meantime, you can obtain a patch from Microsoft by linking from the KB article at <http://support.microsoft.com/kb/884573>.

XP Home users will have to wait for the hotfix. If you're running XP Pro, you can rectify the problem using the Group Policy Editor. Navigate to Local Computer Policy > Computer Configuration > Windows Settings > Security Settings > Local Policies > User Rights Assignment. In the right-hand pane, double-click Access this computer from the network. Click Add User or Group, enter the account name you're using for the scheduled task, and click Check Names. Click OK twice and close the Group Policy Editor.



# Get Rid Of Common XP Annoyances

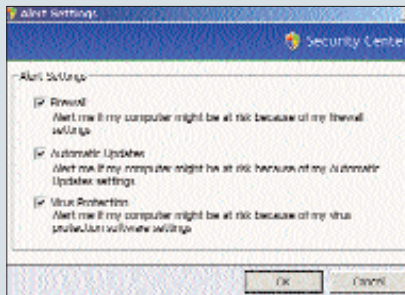
Perfection may only be a concept, but that doesn't mean we take PC imperfections lying down. After all, it's our software. Here's a guide to get rid of some irritants in XP

Kailas Shastry

Imperfections in XP number as many as its wonderful features. We can't, of course, list out all the annoyances you'll come across as you use Windows XP, but we can make a start—here are some of the most commonly hated things about the world's best-loved operating system.

## Pop Those Balloons!

If you're running Windows XP with Service Pack 2 (SP2), you may receive warnings in pop-ups (or "balloons" as Microsoft calls them) from the Security Center service, telling you that the Firewall or anti-virus is not on, or that Automatic Updates is switched off, and so on. You will want to disable Automatic Updates if it's interrupting your work, or if you wish to download them manually. You can disable Windows Firewall if you are not prone to



Put an end to Security Center annoyances

intrusion or if you're using some other firewall.

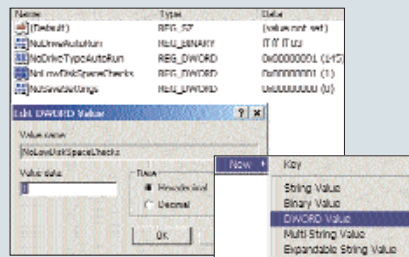
To get the pop-ups off your back, go to the Control Panel and open Automatic Updates or Windows Firewall as the case may be, and turn them off.

To disable the warning that pops up when these services are turned off, go to the Control Panel and open the Security Center, and click on "Change the way Security Center alerts me". Here, de-select the alerts you don't want to receive. Click on OK and exit the Security Center.

## Less Space? I Know, Thank You!

Another common irritant is the low disk space warning that comes up repeatedly when a partition is low on

free space. After the first time, this warning contains no fresh information, and is only an annoyance. You'll need to spend less than a minute in the Registry to disable this warning. Open the Registry Editor by going to Start > Run, typing in "regedit" and hitting [Enter].

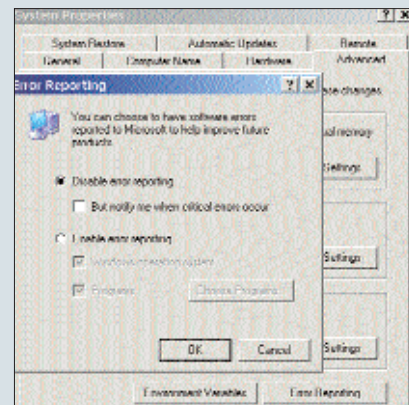


Disabling the low disk space warning

Navigate to "HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer". Right-click on a blank area on the right side of the editor and create a new DWORD value. Name it "NoLowDiskSpaceChecks", double-click on it and enter the value "1". Click on OK and exit the Registry Editor. When you restart your computer, the warning will be turned off!

## Don't Send And Don't Show

When a program crashes, you receive a message asking you if you want an error report to be sent to Microsoft. Most of us just click on "Don't Send". So why not just prevent this window from coming up in the first place? This can be accomplished by a registry hack, but there exists a straightforward



Disable Error Reporting from System Properties

ward way to do it. Just bring up the System Properties dialog box by right-clicking on My Computer and choosing Properties. You could also press [Windows] + [Pause/Break]. Click on the Advanced tab and then Error Reporting. Select Disable Error Reporting. That's it!

## No More Runaway CDs

Every time you insert a CD, the autoplay (or auto-run) feature takes over with a mind of its own. You can prevent Windows from scanning the CD and suggesting an application to use (like you wouldn't know!) via a simple registry tweak.

Open the Registry Editor, and navigate to "HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\CDRom". Change the value of the Autorun DWORD value to "0". If the DWORD is not present, then create it and set its value to "0".

## The Over-Protective Recycle Bin

"Are you sure you want to send...to the Recycle Bin?" How many times have you shouted "YES"? The file is not permanently deleted, and can still be restored from the Recycle Bin. Just right-click on the Recycle Bin and choose Properties. Uncheck the option "Display delete confirmation dialog".

## Cant Remove From Add / Remove Programs

There was this old program you uninstalled a long time ago. It's gone for good, but still appears in the Add / Remove Programs list. This may not be a problem per se, but can be nagging. Go to "HKEY\_LOCAL\_MACHINE\software\Microsoft\Windows\CurrentVersion\Uninstall" and remove the items you don't need.

## Show Desktop Icon Not Shown

The Show Desktop icon must be the most useful Windows shortcut ever. What if you accidentally deleted it? The quickest way to restore it is by going to Start > Run, typing in "regsvr32 /n /i:U shell32" and pressing [Enter]. Your Show Desktop icon respawns in the Quick Launch bar! ■

kailas\_shastry@thinkdigit.com





## Compatibility Concerns

**Q** I have heard that SATA II hard drives may be incompatible with some older SATA I motherboards. I want to buy a hard drive, and I have a SATA I compatible motherboard. Should I go for a SATA I or a SATA II drive?

**Biju Thomas**

**A** The SATA II standard is supposed to be backward-compatible, but you should keep in mind that there do exist a few compatibility issues. Some motherboards that use early versions of Via's K8T880 chipset don't work well with some SATA 3 Gbps drives. Newer chipsets have solved these problems. Because of some of the early incompatibil-

ities, some SATA 3 Gbps (SATA II) drives are actually shipped in 1.5 Gbps (SATA I) mode. You may require a utility available from the manufacturer's Web site to let you set the drive to the faster mode.

For example, Hitachi Global Storage Technologies, manufacturer of the Deskstar line of SATA drives, offers the Feature Tool on the company's download site ([www.hitachigst.com/hdd/support/download.htm](http://www.hitachigst.com/hdd/support/download.htm)).

It's available in three forms, all of which create bootable media, since the utility works only as a standalone app. Some drives, such as those from Samsung and Western Digital, have jumpers for this purpose. Back up your drive before using any utility that can modify hard drive settings.

## Keyboard Kaput?

**Q** I hear faint "beep" sounds as I tap keys on my keyboard. If I need to type in a word that has a letter that repeats consecutively, I have to pause a few seconds before repeating the letter. I even replaced my keyboard, but to no avail. This is getting very frustrating—what can I do?

**Kiran Chedda**

**A** The Accessibility feature in Windows is intended to aid users with physical difficulties in using the keyboard. Accessibility has a feature called FilterKeys that helps such users—when FilterKeys is active, Windows ignores rapidly repeated keystrokes, and drastically slows down the repeat rate. This is similar to what you've described. It looks like you've accidentally activated this feature by keeping the [Shift] key pressed for eight seconds and then clicking OK.

To turn off FilterKeys, launch Accessibility Options from the Control Panel. Uncheck the box titled Use FilterKeys, then click the Settings button. Near the top is a box titled Use Shortcut: uncheck it. While you're at it, also turn off StickyKeys, the option for which is also in the Accessibility Options. This is another feature that can be troublesome if you don't need it. Click OK twice to finish restoring normal keyboard operation.

## When PCs Go Bad

**Q** I've recently bought a high-end PC, and it was performing flawlessly until now. But for the past few days, it has started rebooting spontaneously. This happens mostly during CPU and graphics-intensive applications such as gaming or video rendering. How can I fix this?

**Ravi Patil**

**A** Frequent reboots during intensive operations are most likely due to a hardware problem. There are several possible causes. You will need to check your PC in the following order.

First, the PC may be overheating due to dust accumulation. Over time, dust can gather inside the PC cabinet, layering over heat sink surfaces, memory modules, and circuit boards. You can blow the dust out with something as simple as an air blower.

### Get Help Now!

E-mail us your computing problems along with your contact details and complete system configuration to [sos@jasubhai.com](mailto:sos@jasubhai.com), and we might answer them here! Since we get many more mails per day than we can handle, it may take some time for your query to be answered. Rest assured, we are listening!

Turn off your PC and disconnect it from the mains. Discharge yourself of any static by grounding yourself and rubbing your hands on a metal surface, open the case, and check to see where dust has accumulated. Be sure to use short bursts with the air blower, and also clean the surface of the cooling fans mounted on the CPU and GPU heat sinks.

Another possible cause is a problem with the power supply. You might have exceeded the power supply's capacity to deliver adequate power to the graphics card.

Or it may simply be that the power supply is failing.

Yet another cause could be memory going bad. This can be easily tested by downloading a free copy of Memtest86+ ([www.memtest.org](http://www.memtest.org)). Run Memtest from a bootable floppy or CD. It will run a series of tests on your system memory to check if it is failing.

## Pinpointing A Power Problem

**Q** My old power supply recently failed, and I just got myself a new one. The problem is that my older power supply was a 20-pin type, and the new one has a 24-pin connector. My motherboard only has 20 pins for the main power connector. What do I do now?

**Gerlin George**

**A** You can plug the 24-pin connector into the 20-pin socket on your motherboard. It will go in only one way, and four pins will go unused.

In addition to the wider power supply connector, all motherboards now have an auxiliary 4-pin power connector socket that dedicates power for the CPU. If your motherboard has one such socket, don't forget to plug that one in as well—your new power supply will have the required connector.

We'd like to tell you that the 20-pin connector common in ATX 2.0 power supplies is being slowly replaced by the 24-pin connector. You can also plug a 20-pin, ATX 2.0 power supply into a 24-pin motherboard socket, but it's not recommended, since it cannot provide adequate power for CPU-intensive applications.

The greater power draw of modern CPUs can mean instability if insufficient power is delivered. ■

# For A Few GB More

**Deciding upon a hard disk is a matter of knowing what exactly you want—in terms of space, speed and SATA—and about parameters such as cost per GB**

I was in Bangalore visiting some friends, and since I'm considered the "tech shopper" amongst my zany bunch of friends—mainly because I'm probably the only one who's even opened up a computer—I was immediately put to work. "Get me a hard disk," two friends demanded as soon as I walked out of the airport exit. "Hah, some holiday this is turning out to be," I thought! Both friends explained their needs while we were stuck in a routine traffic jam, though all I could think was, "Now even Bangalore is overcrowded!"

The very next day I was rushed off to a place called SP Road in Bangalore, which is the city's version of Mumbai's Lamington Road.

I was looking for two hard disks, one a budget upgrade for a friend who currently has a 20 GB IDE on an old motherboard, and the other for a music fan who wants to supplement his existing storage with something like a 250 or 300 GB SATA drive. For the first, I went around asking for an 80 GB IDE from all known brands. The prices for this size of disk ranged from Rs 2,200 for Samsung or Seagate to Rs 2,800 for Hitachi drives.

There was little to distinguish between the drives. They were all the standard 7200 rpm, and seek times were 8 - 10 ms. I was surprised to see that one shop still stocked the older 5400 rpm drives from Samsung and Seagate. It's pointless to opt for one of these—the performance hit is noticeable, and the price difference negligible. After checking out three or four shops, it came down to choosing between the 6Y080P0 Maxtor 7200 rpm 8MB buffer drive and the WD Caviar WD800JB with the same specs. The tried and tested Seagate Barracuda was available, but only had a 2 MB buffer. In the end, I decided on the WD Caviar for Rs 2600.

While asking about the IDE drive, I was also looking for SATA and SATA 2 disks. In this segment you will find 200, 250, 300, 320, 400 and even 500 GB disks, all of them 7200 rpm. Between the 160 and 300 GB mark, as capacity increases, the cost per GB decreases. This is different from the case with products such as CPUs, where the cost/performance ratio increases heavily as you opt for even moderately higher models. For example, the Seagate 200 GB SATA costs around Rs 4,000; add Rs 400, and you can get a 250 GB (25 per cent more storage for 10 per cent extra cost). The 300 GB Seagate comes for around Rs 6,000; this

gives you 50 per cent more storage than the 200 GB, for an equivalent 50 per cent increase in price. However, once you're at the 400 GB mark, things change: it costs a whopping Rs 11,000, while the 500 GB is just ridiculous at Rs 17,000!

I decided that the sweet spot was 300 GB, where the price/cost equation was more or less balanced. Now came the choice between the brands. I asked for the specifications of different models until the shopkeepers began showing signs of disinterest, and worse still, chasing me out to accommodate less curious buyers!

## SATA Or SATA 2?

There seems to be a lot of confusion between SATA and SATA 2, and a long lecture is due, but we'll save that for later. For now, let me just tell you that SATA 2 specifies certain additional features apart from speed, like being hot-swappable. You can plug it into your motherboard while the PC is On, and it will be recognised as a mass storage device, similar to a thumb drive. This, coupled with the speed boost, made me decide that SATA 2 was the way to go.

I found a shop selling 300 GB SATA 2 drives from Western Digital, Seagate, and Maxtor, with 16 MB buffers, and also a 320 GB Hitachi with 8 and 16 MB buffer models. The highest-capacity SATA 2 Samsung that was available was a 160 GB. Also available is a slightly more expensive 320 GB with 16 MB of buffer, but it wasn't available immediately (if you get it while you shop, it is worth considering).

The HDT725032VLA360 320 GB Hitachi with 8 MB of buffer and S.M.A.R.T. technology was what I decided on, and it cost me Rs 6,800 (but remember that prices will vary almost every week and from city to city).

My friend was quick to ask, why not the Western Digital 300 GB with 16 MB of buffer? I had to explain that the Hitachi's higher density per platter outweighs the buffer difference, giving better performance. When you have more data on less space, the mechanical strain caused to and by the read/write head is reduced. Thus, you also get longer life. ■




Illustration Pradip Ingale

Want more of Agent 001? Turn over to read his answers to your buying questions

## Motherboard Muddle

**Q** I want to buy an AMD64-based machine. I have decided to opt for an AMD64 3000+ processor, 512 MB of memory, a 120 GB hard drive, and good onboard graphics. However, I am not able to pin down a particular motherboard. I would like to have a PCIe slot for a later upgrade, FireWire, Gigabit Ethernet, 8-Channel audio and SATA 2 support.


**S Dheeraj**

 As far as motherboards for the AMD64 processors go, you can opt for the ASUS A8N-VM CSM or MSI K8NGM2 series. They have all the features you're looking for. Both these motherboards also have onboard graphics that can be allocated 128 MB of your main memory. The onboard graphics is good enough for casual gaming, but don't expect it to run high-end games. The ASUS A8N-VM CSM is available for around Rs 7,500.

## What Would Agent 001 Do?

**Q** I have an nGage and a Nokia 6600, and I want to move up. My budget is Rs 15K to 16K. I don't like the Sony Ericsson K750i. I was thinking about the Nokia 6270 or the Sony Ericsson W800i. Which one do you think is better, and what would you buy? How much does the W810i cost?

**Venkat Deep Rajan**


 I would recommend the Sony Ericsson K750i, simply because at Rs 14,000, it provides the best bang for your buck. A direct comparison between the Nokia 6270 and the W800i would be wrong: though they have similar specs, the target market is different. The Nokia 6270 is targeted towards executives and such who want a feature-rich phone. It still has the old Series 40 UI, and I don't recommend it because new applications are developed for Series 60 phones, not the older Series 40 ones.

The W800i, on the other hand, is targeted towards the young, as is amply clear from the "Walkman" branding. So, simply put, if you need a music-oriented phone, the W800i is your best bet. The W810i is the new version of the W800i—it incorporates some minor changes and has new looks, and costs around Rs 22,000 (street price).

## A Cell Phone On A Budget

**Q** I am looking for a cell phone with a 1.2 megapixel camera, Bluetooth, MP3 player, extendable memory, good colour display and good battery life. It should also have video and voice recording, GPRS and Java support. My budget is below Rs 10,000.

**Lakhya Nath**

 The low budget you have allocated restricts your choices. If you can extend it by about Rs 2,000, you can opt for the Nokia 6630. It has most of the features you've mentioned, and also the fastest processor on a Nokia phone.


## Ask Away!

Want a tech product, but don't know how to go about buying it? E-mail [agent001@thinkdigit.com](mailto:agent001@thinkdigit.com) with your complete contact details, and he might answer them here! Please note that Agent001 only answers purchase-related questions in this space.

## In Search Of An App Cruncher

**Q** I have an old computer that I would like to upgrade to a better-performing one. Apart from games, I will be working on 3D Max, VectorWorks, Flash 8, and some movie editing. I need a computer that can crunch its way through all these. My budget is around Rs 20,000; I can stretch it to a maximum of about 25,000. I would like to know what processor and motherboard are best suited to my kind of applications. I need at least 512 MB of RAM, an 80 GB HDD, a DVD-Writer, TV-Tuner, and optical mouse.

**Shantanu Adhicary**


 For the kind of applications you are looking to run, I would suggest you first upgrade the necessary components before adding any peripherals. First, get a good motherboard-processor combo, ideally an AMD Athlon64 3200+ or above and an NVIDIA 6150 chipset-based motherboard, such as the ASUS A8N-VM CSM. This motherboard has onboard video, but don't expect to play games at high resolutions on it. This combo will set you back by somewhere around Rs 17,000; 512 MB of memory will cost about Rs 2,000.

These new boards require a 24-pin connector, so a new power supply is called for—I recommend an Antec, which will cost at least Rs 3,500. All these together will cost about Rs 25,000, but are required for the kind of stuff you plan to run. You can add components such as the TV-Tuner and DVD-Writer later.

## All's In Place—Except The Graphics

**Q** My PC has an Intel 3 GHz Processor, ASRock 775 Dual-915GL motherboard with PCIe slot, 512 MB of DDR 400 RAM, and a 17-inch SyncMaster 793s CRT monitor. I would like to know the best graphics card I can get for Rs 10 to 15,000 for my system.

**Ashish Vulimiri**

 If you want an NVIDIA card, you should be able to afford one based on the 7600 GT chipset with 256 MB of RAM (around Rs 15,000). For the same price, you could also opt for an ATI X1600 chipset-based card.

Here's a table that lists hard disk prices—there isn't much variation from one manufacturer to another. These are MRPs in Rupees—note that in the case of most dealers, you'll get the disks for a good 10 to 15 per cent less than the MRP. ■

Hard Disk Prices					
SIZE/TYPE	SEAGATE	MAXTOR	WESTERN DIGITAL	HITACHI	SAMSUNG
200 GB IDE	4,750	4,750	4,750	4,750	4,750
200 GB SATA	5,000	5,000	5,000	5,000	5,000
300 GB IDE	6,500	6,500	6,250	6,500	6,500
300 GB SATA	7,000	7,250	7,000	7,250	7,000



100 Talk is Cheap



103 Bug Hunters

# Digital Business

How Technology Can Help Your Organisation

## Case Study

# Milking For Tomorrow

**A scientific and tech-enabled approach to dairy animal keeping can significantly boost the country's milk production, at the village, zonal and state levels**

**Philip Malayil**

**O**ld-timers will remember the days when milk was a rationed commodity. You got up early in the morning, took your milkcard to the nearest milk booth, and picked up an allotted quantity. Operation Flood changed all that: not only did milk become available in whatever quantity you wanted, India became the largest milk producer in the world.

While this may sound impressive, veterinarians are not quite impressed. Dr Abdul Samad, Head of the Department of Medicine at Bombay Veterinary College says, "We may be the largest producer of milk, but this is from the largest population of cows in the world."

### Milking Tech

What Dr Samad is referring to is that when some countries in the world are able to milk 10,000 kilograms of milk from a cow during a lactation cycle of 305 days, we in India manage only 800 to 900 kg—yes, you read that right—just 800 to 900. Now, the same was the

case in countries such as Egypt and Israel about 30 years ago. Today's figures in those countries stand at 12,000 kilograms. The secret, according to Dr Samad, is a scientific approach to the problem—a system of data recording that enables identifying genetically good animals for breeding, analysis of trends, and the prediction of fertility and production problems.

Towards this end, Dr Samad is conducting several pilot projects, one of which is at the farm in Bhilwadi (district Sangli), from where Chitale Bandhu, perhaps Pune's most well-known sweet shop, gets its milk. In collaboration with Mumbai-based Infovet, he has developed a dairy animal health and productivity management software called Herdman. Infovet has also developed other software such as SemenPerfect for semen centres and progeny testing—an important activity for genetic improvement of

Imaging Chaitanya Surpur  
Photograph Jiten Gandhi

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animals, BreedCon for indigenous cow/buffalo breed registry, and [www.pashubazar.com](http://www.pashubazar.com), a site where animals and related products and accessories can be bought and sold. Pashubazar is being implemented with the help of village dairy co-operatives, veterinary hospitals and rural agri-business centres. This is probably the first ever effort towards using information technology in the livestock sector in rural areas.

As a benchmark for quality, the brand Chitale is able to command premium pricing for most of its products. Even a litre of Chitale milk—perhaps the most generic commodity in the value chain—sells for a good rupee more per litre than that from competitors.

The Chitale brand equity is an outcome of careful attention to many details, including a feeding system that ensures that every buffalo consumes an exactly pre-determined portion of feed. The monitoring system at the farm in Bhilwadi includes two tags around the neck of a buffalo, an orange ID tag and a blue smart tag. The former is a simple numbering associated with the ID stored in a computer, and the blue tag is a metallic cover under which a smart card has been locked. Buffaloes aren't really expected to maintain discipline, hence the metallic cover—which ensures there's no damage to the card inside.

Every time a buffalo enters the milking parlour, the transponder—a device that transmits and responds, hence the word—in the strap is identified. A warning lamp lights up on the milking point controller (MPC) at the appointed symbol, if the buffalo has not been milked, or if the milk has not been directed to the tank, as in the case of theft. If the buffalo does not produce as much as expected, a different warning light glows.

### Manning The Herd

It was at this level of existing automation that Dr Samad began his pilot test of Herdman. According to him, the software has been developed for the small- to medium-scale farmer with a minimum of 50 animals. Created in 2003 on a VB-Access configuration, the present version of Herdman uses .NET for the front-end and SQL Server for the back-end.

Every animal in the herd is registered based on its unique ID, and herds and lots are created. Next is the various data entry modules. Records are maintained about pregnancies, calving, illness, treatment, milking, and whether a particular animal is in oestrus.

Periodic monitoring of these records, according to Dr Samad, takes the focus away from “fire-fighting” to health management. For example, a periodic reading of the milking records identifies low performance when it occurs—even a variation as low as 500 ml a day. Herdman not only calculates the averages for the herd or lot, but also the standard deviation for the herd: a low standard deviation indicates that the problem has a common source which needs to be identified, whereas a high standard deviation indicates that only a few animals in the herd are low performers. Effective use of the software does not require daily data entry for milk; once-in-a-month figures are all that the International Committee on Animal Record stipulates. Other data such as insemina-

tion, pregnancy, calving and treatment is recorded as it occurs in the farm or village.

### Statistics And Decisions

Dr Samad further explains how Herdman helps in right decision-making.

When lactation is plotted against days, the curve must peak at 30 to 40 days. Also, 40 per cent of the total productivity is to be achieved in the first 100 days. If this does not happen, the cause of the problem is considered from the earlier-mentioned statistical technique.

In the event of it being a “common-source problem,” the next step is to identify that common source. A typical correlation is that the feed quality or quantity is not proper. This is when Herdman's “Metabolic Profiling” module comes into play: the program identifies “random samples” from the entire herd. This has to include a weighted sample of animals from each category: freshly-calved, mid-lactation, late lactation and dry.

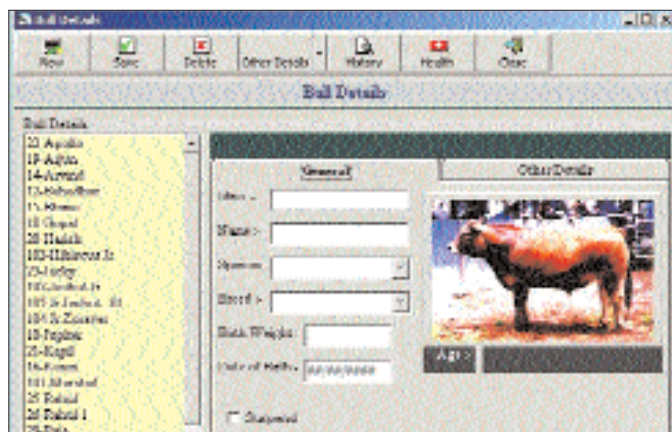
Blood samples are taken from each, and the results are analysed by Herdman as mean plus or minus standard deviation for different haematological parameters—such as RBC count—and chemistry parameters. For feed decisions, chemistry parameters such as blood glucose, blood urea, serum proteins, calcium and other minerals are considered.

### The Software

Other features of Herdman include:

**Action List:** Farm activity scheduling is enabled with an “Action” list generated from the database. List of animals in oestrus (“heat”), those eligible for pregnancy examination, drying off, due for calving, milk recording, and so on, are generated. This streamlines the farm management practice, which no more depends on mere observation.

**Alarm List:** A list of animals not performing in accordance with standards of production and reproduction.



Every animal can be monitored using Herdman

**Feed Formulation and Scheduling:** Based on the feed requirement for different categories of animals—lactating, dry, pregnant, and so on—Herdman generates a feeding schedule. Cost of feed and cost per animal, too, can be tracked.

**Herd Performance Indices:** Production and reproduction-based herd indices are calculated as mean plus or minus standard deviation for each

lot or herd. These indices define herd characteristics. For large-scale decisions, the herd has to be treated as a whole: for example, if after tweaking the feed and so on, a particular herd falls below the standards, it will be culled.

**Medical Records:** The lifetime record of all the treatment carried out on a particular animal are held here. The dosage of commonly-used antibiotics and residues within the withdrawal period for each are also inbuilt.

**Report Generation:** Current or date-specified reports of milk production, breeding, bull performance, due for calving, heifers, calves, and so on can be generated category-wise.

The Chitale-owned farm at Bhilwadi with its pre-existing systems used to achieve a milk yield of 2,500 litres in a 305-day lactation cycle against the national average of 800 to 1,000 litres for a buffalo. Herdman increased the 2,500-litre figure by about 10 per cent. Also, a remarkable reduction was seen in the quantity of antibiotics that needed to be used: this was a result of Herdman's ability to predict sicknesses at very early stages. Breeding efficiency was another area of improvement.

### The Next Step: Herdman<sup>Coop</sup>

It was the creation of milk co-operatives that resulted in the present abundance of milk in India. This co-operative movement forms the backbone of the dairy industry in the country. The basic unit is the primary dairy society in a village with 500 to 1,000 animals. Several such societies federate to form the block-level or district-level federation. These federations provide milk collection as well as veterinary input services.

Herdman<sup>Coop</sup> is a version designed to run on the Milk Union Server, with PDAs for data collection at the village levels, and touch-screen access for the village dairy farmer. While the modules are similar to those of Herdman, the critical difference is in data input and validation mechanisms, in the absence of the formal establishment of an organised farm. The zone veterinarian analyzes data for each village, considered as one herd, and works with farmers in optimising fertility and productivity to make the dairy business profitable for the farmers. In March 2004, the World Bank conducted the "India Country Development Marketplace Competition," and invited innovative and novel ideas for improving the access and quality of services in rural India. Dr Samad's proposal to implement IT-enabled veterinary services to improve animal productivity, milk quality and farmer profitability was awarded the top rank amongst 1,500 proposals received from across the country.

Supported by the NABARD (The National Bank for Agriculture and Rural Development), the co-operative version of the software has a two-year research funding for deployment, testing and validation, and is already deployed at Sangamner District Co-operative. Other than being able to improve genetics by planned breeding, it also enables the management of the health and productivity of the animals. Moreover, the data mined is of much value to pharmaceuticals developing drugs for the dairy industry, research institutes for identifying problem areas, and the government for rational planning.

### Vetting For Quality

Most co-operatives have a para-vet who periodically visits the village milk collection centre. Apart from his usual duties, he is enabled with a PDA with a customised application for data collection. All permutations and combinations of entries are already fed in so he doesn't have to type but only select the activity. The para-vet is responsible for updating the (local) data he collects on the milk centre computer.

When the para-vet visits the zonal centre, he hands over a USB stick with the data he has collected to the veterinarian there, who can load it to the server linked to the Milk Union Server. For the case when these visits to the Milk Union Server are irregular, a GPRS data transmit option to the server is being developed. Data from all the Milk Union Servers will thus form a state-level animal grid. The farmers get monthly report in his language describing performance of each cow / buffalo.

A critical aspect of the system is the validity of the data submitted by the para-vet. Among the different options in data authentication is RFID-activated access to the animal data recording module in the PDA, which means an animal's file can only be accessed in the presence of its RFID tag—necessitating that the para-vet visit the animal. Whereas, as of now, the veterinarian only manages



A para-vet showing off his PDA

sick animals at the dispensary, the data recording system would improve services to the farmers since the protocol of services would be generated by the PDA. This will bring veterinary services in India at par with those in the developed world.

Among the developmental issues being tackled is distance-reading capabilities for

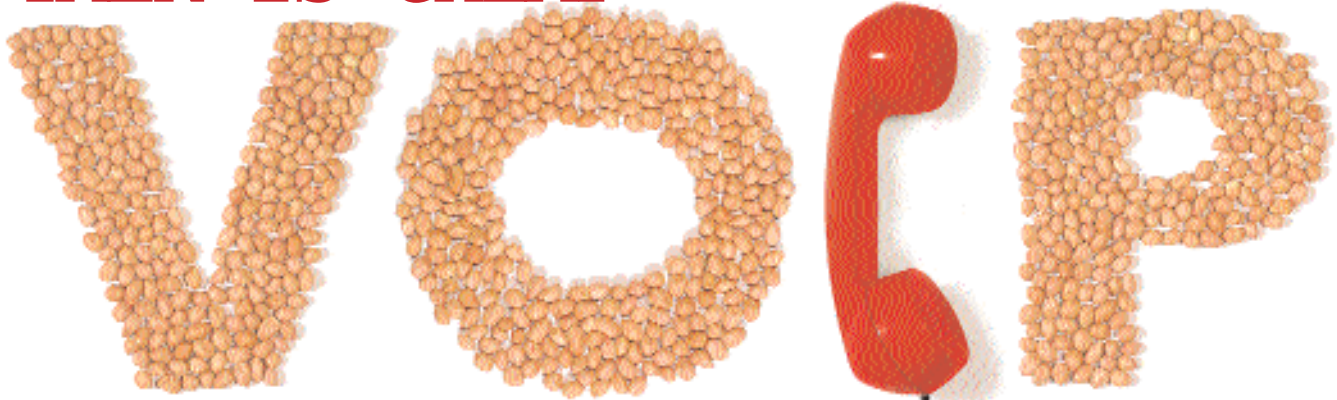
the PDA, since proximity may cause the animal to jerk or damage the PDA reader in other ways.

From the farmer's perspective, he can visit the village milk centre and access records of his animal, get information on animals available for sale and access [www.pashubazar.com](http://www.pashubazar.com). Availability of animal milk, breeding and medical records at the time of sale would fetch the farmer better price for its cow and the purchasing farmer would remain assured that he has bought the right cow or buffalo. Touch-screen access for farmers is also under implementation—this will enable them to access data of their animals from the village milk centre computer by themselves. In developed countries, there are independent organisations for data recording, making the exercise expensive. Dr Samad, assisted by his team, has developed a system wherein the veterinary service provider captures data in the same visit.

Available in all Indian regional languages, Herdman<sup>Coop</sup>, if successfully deployed, could change the face of dairy-farming in India right at the grassroots level: a state-level animal grid could very well bring the Indian dairy scene on par with countries such as Denmark and Canada. ■

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# TALK IS CHEAP



Cut costs by using the Internet to place voice calls

Ahmed Shaikh

**D**id you know your business can cut down on phone bills using the Internet? Internet telephony or Voice over Internet Protocol (VoIP) is a means of transmitting voice data over the Internet. This technology offers a cheap alternative to your landline, and is ideal for placing long-distance conference calls.

Let's take a brief look at how VoIP works, the government regulations involved, and what you need to use it. We also walk through the installation and use of a VoIP software called Skype.

## Can You Hear Me Now?

VoIP transmits voice wrapped into data packets. A voice call made using VoIP is routed over a packet-switched network, whereas a traditional phone call takes place over a circuit-switch network. This is the essential difference between a VoIP call and a regular call over a land line every pro and each con of a VoIP service is a result of this. So what is a packet-switched network? When you make a regular phone call, a dedicated connection is made between the two parties involved. This connection is fixed at the two end-points, and has a fixed route over the phone line. The dedicated connection is maintained until the call ends. A packet-switched network, on the other hand, does not establish a fixed route between the two parties. Each packet can take a different route to its destination; packets can even arrive out of order at the destination. A route is taken on the basis of algorithms that balance various network factors such as latency and hops.

To better understand how a VoIP call works, let's take a look at two parties talking over their PCs. Say Arvind needs to make a call to Swati across the national branches of their business. Let's assume that both Arvind and Swati have Google Talk installed, and that they are listed in each other's contact lists. When Arvind clicks on Swati's username and initiates the call, the software first locates Swati on its network. If Swati answers the call, the software notes her destination address.

When Arvind talks, the voice data involved could be compressed using a proprietary algorithm to facilitate better transfer over the Internet. The compressed voice data is then made into an IP packet each IP packet is essentially a chunk of voice data wrapped around the destination address. The packet is then sent over the routers, switches, servers and cables that constitute the Internet: they hop between routers and switches, changing paths, perhaps taking a physically longer route to avoid network congestion, thus reducing latency, which you can think of as delay.

Each packet might also be tagged with data other than its destination address such as the maximum number of hops (the jumps it makes along the way) it can take, or how important latency is to that particular packet, and so on. It is important to note that each packet need not arrive at the same order at its destination. When packets do arrive at Swati's computer, Google Talk handles three things: the shuffling of the packets such that they get into the same order as they were sent from Arvind, the decompression of the packets to get to the raw voice data, and the transmission of the voice data to Swati's speakers or headset.

Several things happened differently here: no phone number was involved, voice was sent over the Internet rather than a dedicated phone line, and depending upon the quality of the Internet connection between Arvind and Swati, voice packets might have dropped, resulting in bad voice reception.

This last point falls under the purview of Quality of Service (QoS), and is perhaps the largest difference between a VoIP connection and a Plain Old Telephone Service (POTS) one. A POTS service is built upon a circuit-switching network, and has basic QoS guidelines to follow by law. While we might not appreciate the quality over our landlines, it could be worse; indeed, a VoIP connection might or might not ensure a good voice connection. However, some ISPs offer VoIP as part of their service bouquet. These ISPs might ensure a minimal QoS, in which case we recommend you take the service for a test ride before subscribing to an ISP's VoIP service.

Imaging Renu Sharma  
Photograph Jiten  
Gandhi

### Can Only You Hear Me Now?

Another point of contention over VoIP is that of security. In essence, a VoIP service is based on data packets. When you consider that sniffing of data packets is a very real security problem on the Internet, it is clear that your voice calls can fall to the same tools and hacks used. The thought of a competitor listening in to your VoIP calls using packet sniffing tools is quite real here. However, two things need to be considered as far as security is concerned. Firstly, if a determined competitor is indeed involved, even a traditional phone is open to wire-tapping. Secondly, it is possible to establish a secure line over the Internet with the help of encryption. Encryption is an essential tool if you do commerce over the Internet, and its efficiency can be, and is, extended to VoIP.

Fortunately, there are many VoIP-encryption products available. Skype has built-in encryption. Phil Zimmermann of Pretty Good Privacy (PGP) fame has recently released a beta tool dubbed Zfone ([www.philzimmermann.com/EN/zfone/index.html](http://www.philzimmermann.com/EN/zfone/index.html)), an open source product for enabling VoIP security. At the time of writing, Zfone is only available for the Linux and Mac platforms, with Windows availability targeted at mid-April 2006. Moreover, VoIP security is a very visible problem one that companies small and big are aiming to resolve. You can learn more about current and future initiatives at the VoIP Security Alliance [www.voipsa.org](http://www.voipsa.org).

A final note of caution can be made in regards to fly-by-night VoIP providers. Although you can set up a VoIP service yourself, with the basic

amenities available, some ISPs also provide it as part of a data or service package. But as VoIP gains acceptance, small operators are bound to mushroom, and one needs to be chary of subscribing to their services they might well disappear overnight!

For a business in India, there are two options: using VoIP to make cheaper international calls, and using VoIP to make calls to a national branch. The former can be either PC-to-PC or PC-to-phone; the latter can only be between two PCs

### Making The Call

In India, as per TRAI regulation, you can establish a PC-to-PC call anywhere in the world both within and outside India. However, a PC-to-phone connection can only be established between India and a foreign country. TRAI also puts forth certain QoS requirements for VoIP providers. Note that convergence of VoIP with traditional landlines or cellular phone lines is not yet allowed in India: as such, you cannot legally use VoIP to call a landline or a cell phone.

For a business in India, then, there are two options: you can use VoIP to make substantially cheaper international calls, and you can use VoIP to make calls to a national branch. While the former can be either computer-to-computer or computer-to-phone, the latter can only be between two personal computers. Additionally, if your company has a large local network, it can deploy a VoIP solution across it.

The common element here would be a good connection to the Internet. As a rule of thumb, avoid ISPs that connect you via a satellite link—the latencies involved would make for a not-so-great voice connection. Try to stick to providers that connect via undersea cables instead. Some ISPs offer VoIP as separate services; test these

## Using Skype

Skype is the leading VoIP software. Apart from PC-to-PC and PC-to-phone calls, it also allows for large file transfers and text chat. It also automatically encrypts all outgoing data, be it voice or file transfers. This little workshop will take you through the installation and use of the Skype software.

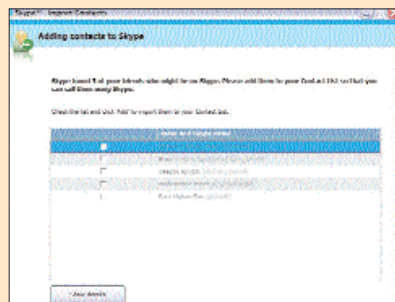
### 1 Download Skype

The latest version of this software also allows for video calls if you have a Web camera. Head to [www.skype.com](http://www.skype.com) to download it.

### 2 Set up your username

Double-click on the downloaded file to start the installation process. After Skype installs, you need to create a profile on the Skype service. The username you supply here must be unique, similar to your MSN or Yahoo! ID. Later on, you can add contacts using this username.

**3 Adding contacts** Skype can automatically add contacts by searching your address books, including those in Outlook and Opera. Allowing the setup program to do this is a good idea. The



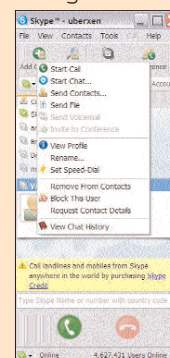
Skype will automatically search your address book for contacts with Skype

software will now determine which of your contacts has a Skype account, based on their e-mail address. Follow this step to its end to add contacts with Skype, or to send a request to your contacts to install Skype and register on its network.

### 4 Making calls

Once a contact has accepted your request, you will be able to place a call to him. Click on the green Call button to make a call; the red button will hang up. Note that you can directly type in a contact's name or phone number in the address field above these icons. To the right of the Contactstab is the Dial section, which offers a traditional dial-pad; to its left is where Skype keeps a history of your outgoing and incoming VoIP calls.

Note that you can start a traditional chat session, transfer files, and set a speed dial by right-clicking on a contact.



Apart from voice calls, you can use Skype to text chat and transfer files

### 5 Calling a phone line

While PC-to-PC Skype calls are free, you need to pay to place calls to a phone line or to a mobile phone. This service is called SkypeOut, and requires that you buy credit from Skype. It is like a pre-paid cell phone account. To check the rates applied per minute, head to

[www.skype.com/products/skypeout/rates/](http://www.skype.com/products/skypeout/rates/)



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“Wise men subscribe when the time is ripe. The unwise keep waiting for a better offer that may never come”

BRIAN TU CHIEK, PHILOSOPHER

A public interest message issued by **digit**



The AVM FRITZ! Mini is the ultimate wireless device. Built around Wi-Fi, it allows you to make VoIP calls to both landlines and personal computers, streams music and podcasts, and displays call information, e-mails, and RSS news

out first before subscribing. Also note that some ISPs charge by data traffic, instead of a flat monthly or quarterly rate. For such a service, you are likely to be billed for a voice call, since a voice communication over the Internet essentially involves exchange of data packets

### Dialling Into VoIP

The minimum requirements for making phone calls over the Internet are: a PC at one or both ends, VoIP-enabling software running on the computer(s), a microphone, and speakers or headset. You then install the software at every computer that you need to connect to, and go through the sign-up process for the software. Placing a PC-to-PC call is as simple as double-clicking on a contact's ID in the software; dialling to an outstation phone line will require you to dial the phone number.

Apart from this simple solution involving your computer, you can also pick up a VoIP-enabled handset to make calls. Such handsets resemble traditional phones, and generally connect to the Internet via Wi-Fi, or even through cable. A handset will support a particular software implementation; for example, Skype is widely supported by such solutions. The handset then effectively replaces your computer/speaker/microphone combination. Moreover, if the handset uses Wi-Fi to connect to the Internet, its usage area is only limited by the Wi-Fi coverage in your company or location.

Some handsets also allow traditional GSM calls to be made; you can switch to VoIP when you are under Wi-Fi coverage, and fall back to the cellular network when outside the coverage area making for a comprehensive and cheap communication solution.

### Talk Isn't Free

When it comes to call charges, most ISPs or software solutions provide free computer-to-computer calls. They, however, charge a per-minute rate for PC to phone calls; this rate varies with the ISP and the software, and it also depends on what country you wish to connect with. Even so, a phone call made over the Internet is significantly cheaper than one made over a traditional phone line or using a cell phone.

Whether you're making a PC-to-PC or a PC-to-phone call, you will need the appropriate software. This can either be generic IM software such as MSN Messenger, Yahoo! Messenger or Google Talk, or it can be software specifically designed for VoIP calls such as Skype, Zoep, or JahJah.

Apart from cost, an important benefit of VoIP is that as long as you have a connection to the Internet, you can field a call. An incoming call, for example, is automatically routed to a VoIP-enabled phone, irrespective of where you are.

With a sufficiently fast Net connection, this can be of great benefit to a business. Since you are essentially transferring packets over the Net, a VoIP connection can be quite data rich: you can hold a video conversation, for example, exchange documents over an open line, seamlessly invite other parties to a conference call, access address books, and be aware of the online status of colleagues. Of course, the availability of such services depends upon the software used to dial in or out. ■

readersletters@thinkdigit.com

# Bug Hunters

**It was realised a while ago that testing should be an integral part of the software lifecycle. The demand for software testers can only grow**

**Philip Malayil**

**I**n October 1999, the \$125 million NASA Mars Climate Orbiter was believed to be lost in space as a result of a data conversion error: it was determined that the software used on the spacecraft had certain data in English units that should have been in metric units. Among other tasks, the orbiter was to serve as a communications relay for the Mars Polar Lander mission, which failed for unknown reasons in December 1999. Several investigating panels were convened to determine what allowed the error to go undetected, but as of 2000, NASA was still trying to figure out what caused the failure of the Mars Polar Lander.

Software bugs caused the bank accounts of 823 customers of a major US bank to be credited with \$924,844,208.32 each in May of 1996. The American Bankers Association claimed it was the largest such error in banking history.

Moral of the story: in a world increasingly dependant on software, the consequences of bugs in programs can be majorly disruptive—or even catastrophic.

## No Monkeying Around

The software lifecycle begins when an application is first conceived and ends when it is no longer in use. Among the various stages, test planning, testing, and re-testing are therefore vital. It is this function that the Software Tester or Quality Analyst (QA) fulfils.

Software Testing has come a long way from the days of “monkey testing.” According to Abhay Joshi, chief engineering officer of Disha Technologies, a Pune-based independent testing firm, “Testing used to be an afterthought. In the early days of mainframes, and later on with the PC, it was thought that if a monkey entered all sorts of random input sequences, hidden bugs in the software would be found. As if real users would behave like monkeys instead of doing their routine work!”

## Jobs For The Asking

For those considering careers in testing, the Indian scene looks optimistic. Apart from the typical opportunities in development firms, testing is an area where considerable outsourcing action is projected. Also, QA is often the starting point for many clients, as there is less apprehension about Intellectual Property violation. According to market intelligence firm IDC, the global market for software testing is expected to touch \$13 billion by 2007. Of this, \$4 to \$5 billion is the offshore share. It is this part of the pie that is expected to increase the Indian market size from \$800 million at present to \$2 billion by 2007.

Pankaj Agarwal, CEO, Sopra Group (India), a subsidiary of the European consulting, systems integration and application outsourcing company Sopra, Newell and Budge, speaks about the thought behind his company’s plan to recruit 800 test engineers in the next 18 months at their Noida facility. “Testing services as part of the overall revenues have gone up considerably. Also,



the kind of tasks now coming to India are high-end enterprise software and mission-critical applications. This has seen high performers.”

Agarwal sees India as a talent pool, and his company has a policy of hiring fresh graduates as 15 per cent of the workforce. They also offer paid internships to final-year students of tier I and tier II engineering colleges, and later on absorb most of the candidates. At other levels of entry, Agarwal mentions Mercury Certified Professionals as being in high demand.

### Fun And Games

With the increased deployment of IT systems in manufacturing and healthcare, software testing is set to get a fillip. The gaming industry is another prospect. Of the global valuations of \$12 billion, the software testing potential of this industry is estimated at \$150 billion. The president of a Bangalore-headquartered software testing company that had more revenues from the telecom segment than from any of their other operations, recently mentioned in an Economic Times report that his 150-strong game-testing team was expected to be beefed up to 350-400 within a year’s time. Game lovers have never had it better: join this industry and make a living playing games all day!

Rachna Salgia, Director, Engineering of Cupertino, California-headquartered Impetus Technologies with six development centres in India says, “Over the past three to four years, testing has gained importance partly due to the nature of work that’s being outsourced.” Salgia affirms that while development is considered more glamorous, good testers are valuable and sometimes may be paid marginally higher.

Institutes	
AmitySoft, Chennai	Technology (QSIT), Bangalore
Anna University, Chennai	Offers certification programmes in software testing—Certified Security Testing Professional (CSTP).
Offers software testing as one of the elective subjects in the ME Software Engineering degree course.	Vyom SQT Labs (SQT)
Electronics Test and Development Centre, Chennai	A Pune-based company focused on training, recruitment and consulting in software quality, testing, infrastructure, and service.
QAI India, New Delhi	
Quality Solutions for Information	

### The Requirements

We ask her about the qualities one looks for in an aspirant. “A desire to explore is important. While developers are concerned with the depth of an application, for a QA person it is the breadth. He should also be able to put himself in the end-user’s shoes. Good communication skills are vital to convince the developer—who can be passionate about his output—of the need for alterations in functionality.” Joshi of Disha technologies adds, “A candidate’s academic background must include engineering training with courses in computer science fundamentals, computer organisation, data structures, software design concepts, programming fundamentals, and software engineering.”

According to Salgia, while a tester can do without development experience, a developer should necessarily have some testing experience.

However, Joshi says in contrast, “It’s a common misconception that one doesn’t need to know programming or software development to perform software testing. A lot of testers these days do not stop at simply reporting bugs; they try to pinpoint the problem.”

### Getting Your Hands Dirty

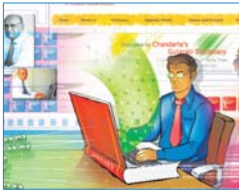
While functionality testing—verification of the functional specifications—constitutes the largest chunk of testing carried out by product companies, it is just the beginning. Performance testing finds out how the software will perform under reasonable as well as unreasonable loads. Security testing aims to discover vulnerabilities in the software that might allow hackers to steal information or cripple its function. Accessibility testing verifies that people with physical handicaps can use the software without problems. Joshi advises, “Anyone who wants to build a career in testing should explore some of these areas.”

Two critical areas that are seeing an acute shortfall of manpower are automation and white box testing. Salgia says, “Good testers in these two domains are a rare breed. We have a tough time finding a white box tester.” She further advises that anyone who plans a career in testing should spend at least a year in manual testing before jumping to automation tools. Also, understanding the software development process gives the tester an appreciation for the developers’ point of view, and reduces the learning curve in programming software that automates the testing process.

Software testing, in many ways, is like a crime detective’s job. You look for clues, get into the mind of the programmer, try to re-trace his footsteps, use tools to study evidence, and find that evasive bug. And while at it, also build a lucrative career. ■

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Types Of Testing	
<p><b>Regression Testing</b> Re-testing of a software system that has been modified to ensure that no previously working functions have failed as a result of the reparations, and that the newly added features will not create problems with previous versions. <b>Tools:</b> WinRunner, SilkTest, RationalRobot, QuickTest, TestComplete</p>	<p>bug reports, with a front-end that facilitates actions such as changing the state to reflect the progress of the work done. A change-tracking system is an editable database containing information included in document revisions. <b>Tools:</b> ClearQuest, GNATS, Bugzilla, d-Tracker, TeamTrack, Test Director, Visual Intercept.</p>
<p><b>Load Testing</b> Spotting bottlenecks in a system under large user stress scenarios. <b>Tools:</b> LoadRunner, SilkPerformer, WebLOAD, OpenSTA.</p>	<p><b>Memory Leak</b> A memory leak is unnecessary memory consumption by a program. The most common manifestation is the failure to release unused memory that has been allocated by the operating system. <b>Tools:</b> JProfiler.</p>
<p><b>White Box Testing</b> Unlike black box testing, white box testing uses specific knowledge of programming code to examine outputs. <b>Tools:</b> BoundsChecker, Purify, PureCoverage.</p>	<p><b>Software Configuration Management (SCM)</b> The collection of processes and tools that are used to effectively manage the development, maintenance, and build processes of software. <b>Tools:</b> Concurrent Versions System, Visual SourceSafe</p>
<p><b>Defect and Change Tracking</b> A defect tracking tool is a database of</p>	



**115** Spreading The Word



**118** Amped!



**152** Royal Mail

# Digital Leisure

Technology Beyond Work

## Lead Feature

# www.timepass.com

**Away boredom! The Power of Web Compels You!**

**Ahmed Shaikh**

**A**h yes, boredom. It seems that most of our lives, we're either inflicting it upon others, or it's being inflicted upon us. But things can get better. Our collective souls must have scored some positive karma somewhere along the line—for release is a Web site away. Let these pages be a spiritual guide to nirvana and bliss, no trees required, just a decent connection to the Internet (a small miracle in itself?), and sundry Web plugins.

Our sole weapon against boredom is going to be games: small, easy-to-play arcade or word games created for the Web browser. Most of this content requires the Flash or Shockwave plugins—if you surf the Internet regularly, you likely have all you need. If you don't, check out our companion DVD and CD. Some of the sites we talk about might require Java, or a proprietary plugin such as Vircos Webplayer. You will need to bear this plugin dance, for

attaining nirvana must always be a test. The good news is that modern Web browsers are capable of prompting you to install the correct plugin.

What you need to look out for, however, is malware. If you have been reading these pages regularly, you must be well aware of a dozen ways your system can be infected with malicious software. Downloading blindly or clicking blindly are probably the top two reasons. So be aware of what you click; don't download anything that looks suspicious (avoid downloading from these sites, we would suggest). And keep both a virus scanner and a spyware/

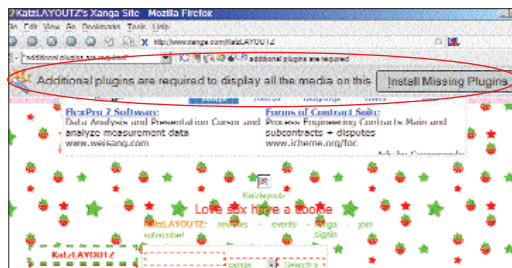
Illustration Chaitanya Surpur

Illustration Pradip Ingale



## Digital Leisure | Lead Feature

Trojan detector running. If you're using Internet Explorer as your primary Web browser, we recommend installing the Windows Live Toolbar—head to [ideas.live.com](http://ideas.live.com) for this and other Windows Live tools.



Modern browsers can detect missing plugins, prompting you to install them

Finally, make sure you read the sidebar *Playing The E-mail Game* before you proceed with the rest of this article. For the path to nirvana is strewn with danger and peril.

### Miniclip.com [www.miniclip.com](http://www.miniclip.com)

This is one of the largest online databases of games. The site offers a range of activities, from Flash and Shockwave content, which can be played via a Web browser, to downloadable content that can be installed in the traditional manner. Note that the site mixes its content offering—some of the games available are free, and Miniclip.com claims there are about 150 such games on its site. Other offerings require a small payment in order to enjoy the entire game. Free or otherwise, some of the games available require you to create an account. The signup is used to track your progress, rank you on a worldwide leader board, and even enter you into competitions.

Make sure you know what you are signing on for before divulging personal information.

Interestingly, the Web site

### Playing The E-mail Game

Since there is no such thing as a free lunch, doubly so online, expect to divulge personal information on a regular basis. Web sites will cajole or force you to sign in, in order to experience whatever they have on offer. The wisest course to take in such matters is to create a trash e-mail ID. Choose a well-known Web mail provider such as [hotmail.com](http://hotmail.com) or [yahoo.com](http://yahoo.com), and create an ID meant for signing up for anything online. Say you've created [spamme-here@<provider>.com](mailto:spamme-here@<provider>.com)—now use this ID to sign up for all and sundry. One spam ID to bring them all; keep your personal and professional e-mail accounts clean

offers a toolbar for IE that lists the latest games available, allows you to preview these games, and also to maintain a cache of your favourite titles.

### Monster Truck

[www.miniclip.com/monstertruck/monstertruck.htm](http://www.miniclip.com/monstertruck/monstertruck.htm)



Monstertruck

Crush cars, take to the air, and perform incredibly over-the-top stunts in this side-scrolling, action-packed monster truck thriller.

### Robot Rage

[www.miniclip.com/robotrage.htm](http://www.miniclip.com/robotrage.htm)



Robot Rage

Build the best robot you can. Win battles to earn points and use points to buy upgrades. Take on the world!

### MotherLoad

[www.miniclip.com/motherload.htm](http://www.miniclip.com/motherload.htm)



Motherload001

Use your digger to excavate as much ore as possible. Use the money you earn to upgrade your digger and move deeper and deeper underground, to unearth the mysteries from below

### Heli Attack 3

[www.miniclip.com/heliattack3.htm](http://www.miniclip.com/heliattack3.htm)

Destroy all enemy units to progress through snow, jungle,



Heli Attack

canyon lands and lab levels... featuring over 30 weapons.

### Red Beard

[www.miniclip.com/redbeard.htm](http://www.miniclip.com/redbeard.htm)



red beard

Activate the LIFTS and PLAT-FORMS by collecting the MATCHING coloured balls. Collect the gold to complete the level. A fiendish and diabolical game! Aaarrrr!

### Also Try

*Canyon Glider:* [www.miniclip.com/canyonglider.htm](http://www.miniclip.com/canyonglider.htm)

*Radical Aces:* [www.miniclip.com/aces/index.htm](http://www.miniclip.com/aces/index.htm)

*Rack Runners:* [www.miniclip.com/rackrunners.htm](http://www.miniclip.com/rackrunners.htm)

*David:* [www.miniclip.com/david.htm](http://www.miniclip.com/david.htm)

*Snooker Multiplayer:* [www.miniclip.com/snooker.htm](http://www.miniclip.com/snooker.htm)

### Li'l Games

[www.lilgames.com](http://www.lilgames.com)

This is not the most professional of sites. It opens with a lame April fool's joke proclaiming a "super stupendous, inspiring, emotional roller coaster inducing, crazy wacky ultimate game ever created or even imagined ever in the history of Web entertainment!!" That apart, it is littered with misspellings, dead links, and incorrect explanations for games. But hey, there are some pretty fun titles around!

The site is a good portal for a range of addictive games from word puzzles to basketball. For the lazy among us, the site also offers a few cartoon strips and a bunch of e-cards to while away

the time. Interestingly, the site allows you to buy some games for not only the PC but also for mobile platforms—Pocket PC, Palm, or even the cell phone.

### Spore Cubes

[www.lilgames.com/cubes.shtml](http://www.lilgames.com/cubes.shtml)



Spore Cubes

Click groups of two or more of the same-colour cubes to make them explode. The goal is to clear all cubes and attain a score of ZERO.

### Snap Shotz

[www.lilgames.com/snapshotz.shtml](http://www.lilgames.com/snapshotz.shtml): You have 5 rounds. A random



Snap Shotz

image puzzle will be selected in each round. You then have 45 seconds to find all the differences between the two images.

### Push-Pull

[www.lilgames.com/pushpull.shtml](http://www.lilgames.com/pushpull.shtml):



Push Pull

The goal is simple—try to get all blocks into a “down” position. You do this by pushing a block down, or pulling a block up by clicking it. This will also alter the state of each adjoining block.

### Word Crunch

[www.lilgames.com/word\\_crunch.shtml](http://www.lilgames.com/word_crunch.shtml)

The game presents a word to you. Your goal is to locate the word and highlight it. Fun, simple, yet addictive.



Word

### Funky Pong 2

[www.lilgames.com/funky\\_pong\\_2.shtml](http://www.lilgames.com/funky_pong_2.shtml)



Funky Pong

Move the paddle around with your mouse, to keep the ping-pong ball bouncing on the paddle. Don't let the ball go outside of the circle, or miss the paddle. See how long you can go! Not as easy as it sounds!

### Also Try

*Lunar Command*: [www.lilgames.com/lunar\\_command.shtml](http://www.lilgames.com/lunar_command.shtml)

*The Sheep Game*: [www.lilgames.com/sheep\\_game.shtml](http://www.lilgames.com/sheep_game.shtml)

*Fly Eatin*: [www.lilgames.com/fly\\_eatin.shtml](http://www.lilgames.com/fly_eatin.shtml)

*BBall Shoot-Out*: [www.lilgames.com/bball.shtml](http://www.lilgames.com/bball.shtml)

*Urban Adrenaline 3D*: [www.lilgames.com/urban\\_adrenaline\\_3d.shtml](http://www.lilgames.com/urban_adrenaline_3d.shtml)

### Armor Games

[www.armorgames.com](http://www.armorgames.com)

If word games make you cringe and make you feel less of a man, if action be your bread and mayhem your butter, and bullets sweet delicious jam; you need to visit this little nook of the World Wide Web. Mmm, delicious actiony goodness! The great thing about this site is its simple layout. Right at the front page the Web site lists the Top Games (which are all cool), and its new entries. The Web site also has a downloads section. However, we do not quite trust the material here, and would recommend that you stick to the Web-based games.

### Also Visit

[www.gamezebo.com](http://www.gamezebo.com)

“For reviews, previews, and everything you’ve ever wanted to know about casual games but were afraid to ask”.

[www.goodexperience.com/games](http://www.goodexperience.com/games)

A human-filtered list of online games that “offer a good experience”

[www.games.yahoo.com](http://www.games.yahoo.com)

Yahoo! Got! Games! Alright!

[www.zone.msn.com](http://www.zone.msn.com)

Microsoft’s gaming too. Check out the game buzz section for the hottest titles

[www.realarcade.com](http://www.realarcade.com)

A good collection of games but unfortunately, the site requires you to download the RealArcade application to enjoy its selection.

### Unreal Flash

[www.armorgames.com/games/unrealflash.html](http://www.armorgames.com/games/unrealflash.html)



Unreal Flash

It’s like Unreal Tournament made Flash! Unreal Flash is a side-scrolling shooter which is fun to play, with a wide variety of weapons and even a bunch of characters to choose from.

### Fancy Pants

[www.armorgames.com/games/fancypantsadventure.html](http://www.armorgames.com/games/fancypantsadventure.html)



Fancy Pants

This one’s a classic platformer in the vein of a 2D Mario from long ago. Jump, avoid, open mysterious doors, and find secrets—excellent artwork and presentation makes this a unique experience.

### Sonic the Hedgehog

[www.armorgames.com/games/sonicthehedgehog.html](http://www.armorgames.com/games/sonicthehedgehog.html)



Sonic the Hedgehog001

That's right! It's Sonic, but wait, there's also Tails, Knuckles and Cream to choose from. A blast from the past, in this insta-classic!

**Battle for Gondor**

www.armorgames.com/games/kingdombattle.html



Battle for Gondor

Inspired by the *Lord of the Rings* trilogy and made in Flash, the gameplay is pretty simple at the onset but gets a bit challenging as you progress through the game. Battle for Gondor mixes button-mashing with a bit of strategy and micro-management of resources. Pretty cool for a flash game!

**String Avoider**

www.armorgames.com/games/stringavoider.html



String Avoider001

Avoid colliding with walls and guide your string through each unique level. Time is of the essence as you must steadily travel through 26 levels to victory.

**Also Try**

*Super Biology Adventure*: www.armorgames.com/games/superbiologyadventure.html  
*Commando 3*: www.armorgames.com/games/commando3.html  
*Franky the Fish 2*: www.armorgames.com/games/frankythefish2.html  
*AstroBlaster*: www.armorgames.com/games/astroblaster.html

com/games/astroblaster.html  
*Mega Tank Beta*: www.armorgames.com/games/megatankbeta.html

**Jay Is Games**  
 www.jayisgames.com

Jay Bibby does all the hard work for us here. Jay dabbles with game design and thus finds himself with the task of scouring the Net for small casual games, evaluating them, and telling the rest of us about them. The Web site is pleasantly laid out and offers a list of recommended games, for when we just need to click and get playing. Being a blog, the site also rambles through new and unique games across platforms. We highly recommend his Classic Games selection, and of course the following gems.

**Twin Spin III**

jayisgames.com/archives/2005/10/twin\_spin\_iii.php

The game consists of two balls that form the end of a baton. The idea is to click the mouse button to move the baton around either of the balls as its center. The goal of the game is to blow up all the balloons which lie around the level. Heaps more fun than this dull write-up might suggest!



Twin Spin III

**SnowDays**

jayisgames.com/archives/2004/12/snowdays.php



SnowDays

Make your own, unique snowflakes. Make paper cuts using an onscreen pair of scissors, and fold them open to reveal your very own creation—plenty of fun with the experimenting involved. A unique twist here—the program lets you pick up randomly falling snowflakes, each of which are assigned the name and location of their creators along with a personal message. You can reply to these messages, which the creator can choose to be notified of. A pretty cool feature!

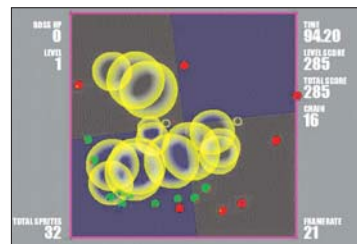
**Maeda Path**

jayisgames.com/archives/2005/03/maeda\_path.php

Much like *String Avoider*, this game is all about hand-to-eye coordination, the goal being to guide your cursor through a moving path without touching the walls. While the idea may be derivative, the execution is brilliant. An amazing visual presentation accompanied by beautiful musical tones (an acoustic guitar's) make this a great game to unwind to.

**Pretty Pretty Bang Bang**

jayisgames.com/archives/2006/02/pretty\_bang\_bang.php



Pretty pretty bang bang

You are a tiny white dot; your goal is to avoid red dots. Click the left mouse button to explode, blowing up surrounding red dots. Exploded red dots will turn green. You get points by chaining explosions—psychedelic colours and cool music make this game a, umm, blast to play!

**Kung Fu Hustle games**

jayisgames.com/archives/2005/05/kung\_fu\_hustle.php

This trio of games is based on the hit Hollywood flick *Kung Fu Hustle*. *Kung Fu Fighter* is a simple 2D side-scrolling beat-em-up. *Axe Gang Rampage* is akin to a vertical shooter and lets you play as the *Axe Gang* from the game. Finally, *PigSty Panic* is a platformer with some off-the-wall humour. All three from Sony Pictures—try them out!

**Also Try**

*Triglav*: jayisgames.com/archives/2006/01/triglav.php  
*Ringmania*: jayisgames.com/archives/2005/11/ringmania.php  
*Atoms*: jayisgames.com/archives/2005/09/atoms\_1.php  
*3wish Adventures*: jayisgames.com/archives/2005/07/3wish\_adventure.php  
*Mansion Impossible*: jayisgames.com/archives/2005/10/mansion\_impossible.php

readersletters@thinkdigit.com

# Spreading The Word

**A passion for a language saw one man through numerous attempts to make it widely accessible, spanning generations of tech—from the typewriter to the Internet**

Jyotsna Rege

When octogenarian Ratilal Chandaria looks back at all the time he spent on realising his project, [www.gujaratilexicon.com](http://www.gujaratilexicon.com), which is an online Gujarati lexicon, his pride is mixed with a hint of frustration. “It took me far longer than it should have,” he says, referring to the fact that the lexicon is an effort of twenty-odd years.

How did someone who began work in the '80s think about building an online lexicon? Well, he didn't. Ratibhai started out with the hope of increasing the use of the Gujarati language in conjunction with the typewriter.

## A Dream Is Born

Born and brought up in Africa, Ratibhai had studied Gujarati as a language in school. The onset of World War II brought him to India, and it was here that he learnt to type in Gujarati on a Remington Gujarati typewriter. Even as a

young boy, Ratilal took pride in his language, and wondered, “Would it be possible to employ technology to help proliferate the use of Gujarati?” He hoped of doing something constructive towards an as-yet-undefined goal.

As Ratibhai neared retirement, he channelled more and more time and energy towards his passion—the Gujarati language. He was in his fifties at this point, and wanted to create a tool through which people would be encouraged to use the language—even if they were living outside India. He spent two years trying to persuade companies to produce electrical typewriters with Gujarati keys.

## Golfballs And Fonts

Then in the '60s came the IBM Golfball. This typewriter, instead of the typebar—a small metal arm inside a typewriter with characters at its end—had a pivoting “typeball” that could be changed to enable the use of different fonts in the same document. A Golfball for Devanagiri had emerged, and

this gave Ratibhai hope. IBM, however, agreed to make a Gujarati Golfball only if they received an order for a defined number of typewriters, and this Ratibhai couldn't do. Since it was an independent venture, the high cost of tooling—creating independent fonts for the language and then making the keys—was a limiting factor as well.

By the '70s, computers had arrived, and were making headway in offices in the UK where Ratibhai was now based. His goal now was to create something that would enable typing in Gujarati at a computer. Since a working model of an IBM computer with software for the Devanagiri script was being produced, Ratibhai contacted various companies to attempt the same in Gujarati. He also contacted companies that produced Linotype system machines, which were used by newspaper offices for printing, to see if they could produce Gujarati fonts for computers. As before, his attempts were fruitless.





## New Toys

Thus far, Ratibhai had never used a computer, and what was theory in his head became more concrete when his nephew returned from the US with an Apple Mac for him. He soon heard of someone in the US called Madhu Rye who had been designing fonts for several Indian languages. Ratibhai contacted Rye and was overjoyed to discover that Rye had developed a Gujarati font file. He procured from Rye the font file as well as a keyboard developed for typing in the font. Ratibhai could finally type in Gujarati at a computer, and eagerly experimented with his new acquisition.

## Spelling Gone Awry

Ratibhai discovered that there were too many spelling errors as he typed. He realised that his rusty language skills were responsible for the errors, and to correct them, he required the aid of a dictionary. But unlike the MS Word of today, which has an inbuilt spell checker, there was no such thing for Ratibhai's keyboard. On top of that, innumerable errors occurred with joint letters (*matras*), a core feature of the scripts of all Indian languages. It did not take him long to realise that a spell checker was what was needed if typing at a computer in Gujarati had to be popularised.

Ratibhai had heard of work having been done on an Arabic spell checker, and figured that if work was being done in Arabic, something could be done for Gujarati too. After his initial attempts on the spell checker in Microsoft Word—this was in the '90s—he realised he would need to create an entirely new spell checker: when he tried to enter words into the dictionary of the spell checker from the font file, these appeared on the screen only in Roman characters and sometimes as junk characters. And so the quest continued.

## Towards The Lexicon

Help finally came from India: a fax from a friend informed Ratibhai that one Prem Asang from Pune had been able to create a spell checker for Hindi. After a meeting, Prem convinced Ratibhai that if the Gujarati words could be keyed in to create a lexicon, the spell checker could be built. In his late seventies now, Ratibhai enthusiastically began

work on keying in the words. A magazine that was composing text matter in Gujarati on an Apple Mac agreed to share their database, which speeded up the keying-in process.

Once all the words had been keyed in began the second monumental task—that of correcting errors. With several more months of work, the database had been created. This done, the information was compiled using JavaScript to enable cross-platform support, and a desktop application was developed, which is available on CD today.

Still, Ratibhai was not at peace. The only people who could use what he had created were those he knew. Although his circle was large, he felt that all who could use and wanted to know the language should be able to use the fruits of his labour. The Internet had now replaced the excitement that the computer had created a decade ago, and Ratibhai invested time and money to create his Web site as it is today.

## Culture Via Language

Why so much effort? Well, for one, Ratibhai discovered that Indians abroad still nurtured a love for their culture, and many professed interest in it. Retaining the use of their mother tongue was one of their interests. There were books aplenty, but there wasn't a medium that afforded prompt access to the language—imagine typing in Gujarati, but having to constantly refer to a dictionary!

Even within India, he discovered very little development in the language among the young.

He believes the process to be a kind of domino effect: computers are used with excitement and interest, and if people are encouraged to use Gujarati via typing, they will need a guide they can access quickly. Ratibhai therefore sees his online lexicon as a better medium to conduct spell checks and find synonyms or word meanings as compared to books. "A three-year-old cannot read, but he attempts to use a computer," he says.

## The Site Today

The utility of [www.gujaratilexicon.com](http://www.gujaratilexicon.com) is twofold. While it aids NRI Gujaratis with the language, there are users within India who struggle for a grip on English, and the site helps them as well. Many who live in their native state and gain employment there do not ever feel the need to communicate in English, but their employment might require them to know the language. Ratibhai's site gives such people quick access to a dictionary.

Manikbhai, a government employee from Baroda in Gujarat, recently wrote in to Ratibhai: "Although we use computers in our offices, English was still sometimes a hurdle. Today, with an online Gujarati dictionary, I can pick up the language by myself."

Ratilal Chandaria's efforts are unique when one considers his age and perseverance. It's not the first time an Indian language has been coded for use on a computer, and it's not the last. But while most work starts off with the technical specifications worked out, Ratilal started out only with a dream. ■

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## Gujaratilexicon.com

Ratilal Chandaria's Gujaratilexicon.com is, amongst other things, an online English-to-Gujarati and Gujarati-to-English dictionary. You can type in Gujarati on the Web page on most configurations without having to install anything. Conjunctions, naturally, are supported.

You can download Gujarati keyboard layouts from the site and install them. There are layouts for Windows 9x, ME, XP, and 2000, as well as for the Mac. Once you install a layout and some fonts, you can immediately begin typing in Gujarati in, say, MS Word!

The site has been designed keeping in mind Gujarati users as well as those learning the language. Under the English-

Gujarati section, for example, when you type in a word such as "heat," you'll get the pronunciation of the word in Gujarati, what part of speech it is, and numerous equivalent Gujarati words.

We must mention that the site seems to be under construction.


For example, the "Buy" link at the top: you'd expect to be able to buy the lexicon on CD, but you can't.

Some data the site links to hasn't been implemented in a user-friendly fashion. The site claims an "idioms and proverbs" feature, and there is indeed a database of idioms and proverbs. However, this feature doesn't work nearly as well as you'd expect it to.

# The Internet? Duh... What's that?

**1** What company recently launched a "Windows Vista capable" PC, logo and all, for the Japanese market—becoming the first company to do so?

a) Dell                      c) Epson  
b) Sony                      d) HP



**2** Why was the "@" symbol decided upon—by Ray Tomlinson—for e-mail addresses?

a) It's not often used in any other context  
b) Tomlinson meant it to be "someone AT someplace"  
c) He put all symbols in a bag and pulled out one at random  
d) The "@" is the most easily accessible on the keyboard

**3** Your keyboard has a "SysRq" key. What was it originally for?

a) It was something like a [Ctrl] + [Alt] + [Del] in early DOS versions  
b) It invoked the OS on the PC/AT introduced by IBM  
c) It was the system shutdown button on the PC/XT  
d) On early PCs, it displayed how much memory was in use

**4** What is the AMD Athlon 64 FX-60's claim to fame?

a) It was the first AMD processor to use HyperTransport

b) It is arguably the fastest all-round off-the-shelf processor today  
c) It was the first-ever dual-core chip  
d) The standard package comes with an overclocking kit

**5** InPhase technologies recently crammed a massive amount of holographic data into one square inch. How much?

a) 48 GB                      c) 515 GB  
b) 203 GB                      d) 2.25 TB

**6** Arguably the first conception of the Net was by J Licklider in 1962 at MIT. What did he call it?

a) The System Spanner  
b) Networked Nodes  
c) A Planetary Grid  
d) Galactic Network

**7** Which of the following about an American President or Vice President is true?

a) George W Bush: Promoted the Internet  
b) George H W Bush: Couldn't use it  
c) Al Gore: Claimed to have invented the Internet  
d) Dan Quayle: Didn't know what the Internet was

**8** Intel in April unveiled its version of the low-cost-computer-for-the-masses. What is it called?

a) Suraksha                      c) NaiDuniya  
b) Jaagruti                      d) Suraj

**9** Which of the following is not in Asimov's (approximate) Three Laws of Robotics?

a) Robots must never harm humans  
b) Robots must follow instructions from humans  
c) Robots must protect themselves  
d) Robots must attempt to reproduce prolifically

**10** Which of the following statements about programming languages is true?

a) Eiffel—it's not AI-oriented  
b) LISP—it doesn't have an if-then-else construct  
c) PROLOG - it's all in French, so no-one understands it  
d) ML - it's interpreted, not compiled

Got an interesting question? Send it in with the answer to [tq@thinkdigit.com](mailto:tq@thinkdigit.com) Mark "TQ" in the subject area.

**Did You Know?** During World War II, IBM built the computers used to manage the Nazi's concentration camps. Auschwitz' camp code in the IBM tabulation system was 001.

**Answers**

1. (c) Epson	10. (a) Eiffel—it's not AI-oriented
2. (a) It's not often used in any other context	11. (a) Suraksha
3. (d) It invoked the OS on the PC/AT introduced by IBM	12. (b) Networked Nodes
4. (b) It is arguably the fastest all-duce prolifically attempt to reproduce prolifically	13. (b) Tomlinson meant it to be "someone AT someplace"
5. (c) 515 GB	14. (a) It was something like a [Ctrl] + [Alt] + [Del] in early DOS versions
6. (d) Galactic Network	15. (c) He put all symbols in a bag and pulled out one at random
7. (c) Al Gore: Claimed to have invented the Internet	16. (b) It is arguably the fastest all-duce prolifically attempt to reproduce prolifically
8. (b) Jaagruti	17. (d) Dan Quayle: Didn't know what the Internet was
9. (d) Robots must protect themselves	18. (a) Suraksha
10. (a) Eiffel—it's not AI-oriented	19. (a) It was something like a [Ctrl] + [Alt] + [Del] in early DOS versions

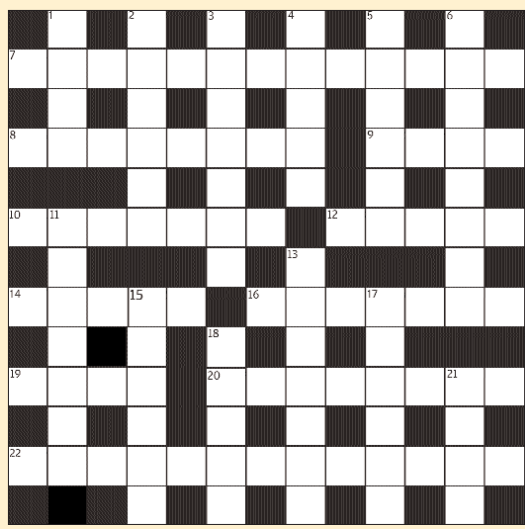
**Crossword**

**ACROSS**

- 'A' in ACL-computer security concept used to enforce privilege separation(7,6)
- Open standard markup language enabling people to interact by listening to sound prompts(5,3)
- Sequence of instructions in computer programming(4)
- Laser or inkjet?(7)
- Virus attack fear(5)
- Wide Field Camera(abbr)(5)
- Backup of computer files(7)
- Short for Mega-Watt(4)
- Very small IC(8)
- India's largest mobile phone operator headed by Sunil Mittal (6,7)

**DOWN**

- Repetition of sound(4)
- Radio transmitter producing signal(6)
- Microsoft spreadsheet programme(2,5)
- Technology of Object-Oriented Languages and Systems(abbr)(5)
- Cursive script of writing on the computer screen(6)
- Opposite of a black&white television(6,2)
- \_\_\_\_\_ button in web browsers updates new data(8)
- Provides hard(paper) copies from the computer(7)
- Software application in which advertising banners are displayed while the programme is running(6)
- Computer enthusiast breaking into computer systems(6)
- \_\_\_\_\_mail-slow postal mail(5)
- Graphic symbols on the desktop or web browser(4)



Send in your answers to the crossword with complete contact details to [tq@thinkdigit.com](mailto:tq@thinkdigit.com) on or before April 15. One lucky participant will win

**Wireless and Mobile All-IP Networks**  
by Yi-Bing Lin and Ai-Chun Pang

Published by **WILEY-INDIA**

**April 2006**



Crossword by Nitta Jaggi

# AMPED!

Be it movies, music or gaming, your experience isn't complete without a great set of speakers. We tested 43 of them—hear us out!



**Jayesh Limaye and Michael Browne**

A speaker set has become an essential part of a computer system today. Historically, the term “computer speaker” conjures up an image of a tiny, tinny set sitting tamely by a monitor. But as the man once claimed, the times are a-changing, and speakers today are a galaxy away from their predecessors, with more watts than warts and greater clarity than many a hi-fi music system available today. In an era where widescreen displays and graphics cards have brought DVD-quality visuals to the desktop, 5.1 speakers bring in the aural content for a truly cinematic experience.

We demand realistic sound, be it in movies, our music or our games. We expect immersion: an explosion should rock the seat; gunfire should trigger a reflexive duck. Sound cards offer features such as DTS 96/24, THX, EAX Advanced HD and so on. To take advantage of these, one needs a good set of speakers, and

whether you invest in a set of stereo speakers or a multi channel system depends on your usage patterns.

For this test, we received 45 speaker sets from 13 brands. The usual suspects were present, along with new entrants such as Xfree, Umax and Gigabyte. Altec Lansing was present in force, and had eight models spanning the 2.1 and 5.1 categories. Gigabyte and Umax were the least-represented with just one model each. The speakers ranged from 2.1 stereo speakers to high end 6-channel sets. On to the show!

### **SOUND ON A BUDGET (2.1)**

If you are on a budget, or are not too interested in multi-channel games or a home theatre setup, a 2.1-speaker set

should do fine. These speakers are meant to play stereo music, and they generally deliver better quality music than an ordinary 5.1 set. We have mentioned the reason for this in the box titled *2.1 or surround sound—What do you really need?* Although 2.1 speakers are not actually stereo in the strictest sense of the term, due to the subwoofer, they produce the stereo left and right channels, with the subwoofer handling the low frequencies. We therefore expect them to perform better in our music tests than with games and movies. We received a total of 27 speakers from 13 manufacturers in this category.

### **A Look At Features**

A 2.1 speaker set is generally light on features, and offers more value for money by sacrificing on the functionality that their multi-channel brethren offer.

Of the units we tested, most did not bundle a remote control, the Altec Lansing MX-5021 and FX-6021 were the only 2.1 models to come with wired control pods

## Digital Leisure | Speaker Test

as well as wireless remote controls. The controls were extensive with volume, treble and bass controls on both the wired and IR units. The Logitech Z-2300 came with a cool wired control pod that featured a large volume dial and a smaller bass dial.

Two sets offered FM tuners. Both were from Philips—the MMS171FM and the MMS177FM. Surprisingly, all the high-end models excluded this feature. While this is not an essential feature, it is a nice addition that we can only encourage.

Even a 2.1 set needs to stand on its own two feet, and stands for speakers are vital, especially for the subwoofer. The stands on the Altec Lansing FX-6021 impressed us. They were solid metal and of good build quality. A surprise was the high-end MX-5021; this Altec Lansing model lacked any form of satellite stand. To the set's defence, however, we didn't encounter any stability issues while testing. The Logitech X-230 deserves a mention as well: the stand quality was good, and even had a swivel base for wall mounting.

### Of Beasts And Beauties

On opening the box marked "Altec Lansing MX-5021," we were struck by the sheer beauty of the set. Even the word "hot" doesn't do justice to describe its dull-finished all-black subwoofer; it

had a sedate cloth grille that barely concealed the silver-coated 6.5-inch driver. Its shiny black satellites had a similar cloth grille wrap, showing off the shiny 1-inch tweeter within, and the dull aluminium-finished 3-inch mid-range drivers (each satellite has two mid-range driv-



Philips MMS177FM

ers). The Altec Lansing FX-6021 was the other attention grabber. It was decked in a sheer metallic grey/silver combination. The satellites showed off six tweeters housed within. Another tiny beauty was the Logitech X-230 with a very attractive satellite design in all black.

The lovable beast of the lot was the Logitech Z-2300. This set boasted the largest subwoofer across the entire 2.1 range, at eight inches.

If we had to choose the sleekest, our unanimous choice would be the Creative I-trigue 3400. Its white/grey colours are reminiscent of Apple Macs with uniquely shaped satellites, while its control pod maintains a traditional look.

### Performance

The Umax PowerBeats UPB 980 just could not hold its own in our game tests. The sound was tinny and very artificial. To be honest, we didn't expect anything else from this speaker set, considering its low price tag and its sub-standard build quality.

The Altec Lansing MX-5021 was the best performer in this test. Our game tests underlined its solid output—reproducing larger-than-life explosions and lending a solid aural punch to rockets zooming past.

In the DVD movie test, too, the Umax UPB 980 along with the Zebronics ZEB-1400W performed poorly and scored very low points. They could not reproduce the faint footsteps in the *Behind Enemy Lines* movie, nor the roar of the truck in *The Fast and the Furious*. On the other hand, the Altec Lansing MX-5021 and the Logitech Z-2300 performed the best in this test. The sounds produced by these speakers made watching these movies an immersive experience.

## How We Tested

Our test PC consisted of an Intel 3.6 GHz Pentium 4 CPU, 1 GB of RAM, a 120 GB Seagate HDD, an ATI X1300 graphics card, and a Creative Audigy 2 Platinum sound card running Windows XP Professional with Service Pack 1.

We put the test candidates through an comprehensive set of intensive tests including a couple of DVD movie tests, multiple music tests and a game test.

The game test consisted of the *Half-life 2* demo—d3\_c17\_12. We ran this demo with sound settings at "high." The demo contains a lot of multiple sounds, blending voice commands with firing and explosions, and is put to good use to test the capabilities of a speaker.

A DTS sampler disc with a couple of DVD movie clips (from *Behind Enemy Lines* and *The Fast and the Furious*) and a 5.1 soundtrack were used as the DVD test material. This sampler disc contains high quality content and is bundled with high-end Creative sound cards—perfect for stress-testing speakers. The soundtrack was rated under bass, treble and vocals.

For music playback we divided the tests into audio CD and MP3. This was further divided into Hindi and English tracks, and sub-divided into vocal-specific and instrument-specific for English tracks and contemporary and classical for Hindi tracks. The MP3s were encoded at high quality settings at 192 Kbps.

For the English CD we used Enigma's *Sadness 1*, an extremely instrument-intensive track that tests a speakers set's ability to reproduce a number of different musical instruments, and The

Corrs' *Brid Og Ni Mhaille*, which is very vocal-centric Gaelic folk music track. For the Hindi CD we used *Aapki Kashish*, for testing vocals. This track also has some deep drum beats good for bass testing. We chose Ustad Zakir Hussain's *tabla* to test sound reproduction of each note.

English MP3's were *Hotel California* by the Eagles—a good mix of vocal and instruments, especially the drum and guitar accompaniments, and Whitney Houston's *I will always love you*, one of the most stressing vocal tracks, as the singer's voice, though rich, can take extreme high notes. On the Hindi MP3 front, we used *Aashiq banaya aapne* to see how a popular track would sound. This track has some beats and instruments with vocal emphasis. For classical, we used Pandit Bhimsen Joshi's rendition to see whether the entire range of his tone could be accurately reproduced.

We also used special test files of a constant frequency to test low, mid and high frequencies across the band. These were from 50 Hz to 15 KHz.

Last, we stress-tested the bass and treble drivers of all the speakers by playing special THX-certified bass and treble tracks.

The tests were carried out at varying volume levels, and in the case of separate bass and treble controls, these were kept at 50 per cent through the first run and 100 per cent through the second.

We also noted the different features (or lack of them) for the different speakers such as the various inputs, connectivity, controls, accessories, and build quality.

## Jargon Buster

**Root Mean Square (RMS):** The sustained power in watts that an amplifier or speaker can output at any given time. It is a much more realistic measure of the sustained power of a speaker than PMPO.

**Peak Music Power Output (PMPO):** The maximum power that an amplifier can output over a short period of time. More of an advertising term nowadays, PMPO isn't an accurate depiction of a speaker's capabilities.

**Frequency Response:** The range of frequencies that the device is set to operate within.

**Dolby Digital 5.1 (Dolby AC-3):** Developed by Dolby, this system has five discrete sound channels in addition to Low Frequency Effects (LFE) that are directed to the subwoofer.

**Dolby Pro Logic:** An older standard, this packs in information for a centre and surround channel in the regular stereo channel. Essentially, there are no discrete left and right channels for the rear or surround speakers.

**Dolby Pro Logic II:** Audio encoded with Pro Logic II carries five channels of sound in a traditional two-channel stereo audio signal, which is then decoded back to five speakers using a Dolby Surround Pro Logic

II decoder. This technology can be used on any console that does not support Dolby Digital 5.1. The advantages of using it in game applications include minimal latency, full frequency range, compatibility with existing cables, and backward-compatibility with mono, stereo and legacy Dolby Surround Pro Logic equipment.

**DTS:** Short for Digital Theatre Systems, this is a standard invented by Steven Spielberg, and made its debut in *Jurassic Park*. It uses a sampling frequency of 96 kHz with 24 bits allocated to each of the six channels. Collector's edition DVD movies generally feature two soundtracks, featuring both Dolby 5.1 and DTS.

**Dolby Digital EX and DTS ES:** These are comparatively new standards that add an additional channel—the rear centre channel—and is implemented in 6.1 speakers. Both standards implement the rear channel in a similar way. For Dolby Digital EX, a special Dolby Pro Logic decoder is added to the surround channels, creating a rear centre channel. This decoding method first came to light with the theatrical release of *Star Wars Episode 1*. For DTS ES, an additional rear centre channel is supplemented to the two surround channels.

**Dolby Pro Logic IIx:** This is a spanking new technology developed by Dolby Laboratories and is the first and only technology to process native stereo or 5.1 signals into 6.1 or 7.1 channel output. Different modes such as Movie, Music and Game are available with this technology, with the Music mode featuring additional user controls such as Dolby centre width, Dolby panorama, and Dolby dimension.

**THX:** This is an abbreviation for "Tomlinson Holman's eXperiment." It's not a surround sound standard, but a seal of approval that is granted to audio equipment and theatres that meet its standards. This standard is further divided into THX Select (for installations up to 2,000 cubic feet) and THX Ultra (for between 2,000 and 3,000 cubic feet).

**S/PDIF:** Sony/Philips Digital Interface; a standard audio file transfer format. Developed jointly by Sony and Philips corporations, S/PDIF allows the transfer of digital audio signals from one device to another without having to be converted first to an analogue format. Maintaining the viability of a digital signal prevents the quality of the signal from degrading when it is converted to analogue.

Next, we played a DVD-Audio disc to test these speakers. The treble, vocals and bass were rated separately for this test. The Altec Lansing MX-5021 once again bettered every other set in this test. Be it vocals, treble or bass, the Altec Lansing MX-5021 proved itself to be the best 2.1 set as far as playing DVD audio was concerned. The Umax and the Techcom speakers were amongst the poorer performers in this test, and we do not recommend them for DVD audio.

Our music test suite comprised English and Hindi audio CDs and MP3 songs. Yet again, the Altec Lansing MX-5021, with its very high dynamic range, did not distort sound even at the maximum volume. The Corrs' folk song had vocals at an extreme range, and the Altec Lansing MX-5021 reproduced the sound more faithfully than did any other speakers in this test category.

The MX-5021 speakers also were capable of accurately reproducing the beats in the Enigma test song. The closest that could come to these speakers was the Altec Lansing CS21.

We moved on to listen to the Hindi audio CD song, and the MX-

5021 and CS21 were yet again leading the pack. With the MX-5021 and the Altec Lansing FX-6021, we could feel the *tabla* on the Zakir Hussain CD as if we were at a live concert.

MP3 music is what most people listen to these days, so this was an important test. The English MP3 songs played very nicely on the Altec Lansing MX-5021, FX-6021 and CS21. They accurately produced the different musical tones, instruments, as well as the vocals, with amazing clarity.

This was no different with the Hindi MP3 songs—these speakers soared ahead of the competition with the best scores.

**BEST BUY**  
**digit**  
MAY 2006



The Tech-Com SSD-801, Tech-Com SSD-901R, Umax PowerBeats UPB 980 and Zebronic ZEB-1400W performed below par in the music tests. These are entry-level speakers, and if you are an audiophile, keep away!

Having thus tested their mettle, we moved on to the synthetic tests.

We conducted frequency tests to gauge the capability of these speakers. The 50 Hz frequency was almost completely missed out by the Zebronic ZEB-SW8000, which means that this speaker set should not be expected to produce low bass tones. Many speakers such as the Umax, the two from Tech-Com, two from XFree, Zebronic ZEB-SW8000, Gigabyte GP-3A, Genius sw-i2.1, Artis S-700, Artis S-111R and the Frontech JIL-1811 performed very badly here and exhibited their weakness in the ability to reproduce a wide aural spectrum. The star in this test, again, was the Altec Lansing MX-5021, which trumped the competition comfortably. Only its brother, the Altec Lansing FX-6021, gave it some competition.

We then conducted tests to gauge the ability of the speakers to handle extreme bass and treble.



Scoreboard		2.1 Speakers			
<b>BRAND</b>	Altec Lansing	Altec Lansing	Altec Lansing	Altec Lansing	Altec Lansing
<b>MODEL</b>	121i	ATP3	CS21	FX-6021	MX-5021
<b>Features (Out Of 40)</b>	10.16	10.75	7.04	17.13	14.71
<b>Speaker Specifications</b>					
Power Rating (RMS)					
Subwoofer/Satellites	9/5.5x2	18/6x2	50/30x2	50/12.5x2	50/20x2
Frequency Response	20 Hz–20 KHz	45 Hz–18 KHz	140Hz–20KHz	32 Hz–18 KHz	30 Hz–22 KHz
<b>Connectors On Speaker Set</b>					
<b>Analog</b>					
Front In	✓	✓	✓	✓	✓
Auxiliary	✗	✗	✗	✓	✗
<b>Controls</b>					
Bass/Treble/Volume	✓/✓/✓	✓/✓/✓	✓/✗/✓	✓/✓/✓	✓/✓/✓
Surround Effects	✗	✗	✗	✗	✗
Others (List)	✗	✗	✗	✗	✗
<b>Bundled Accessories</b>					
External Decoder	✗	✗	✗	✗	✗
Power Adapter	✗	✗	✗	✗	✗
Speaker Stands	✗	✗	✗	✗	✗
Remote Control (Wired / Wireless)	✗/✗	✗/✗	✗/✗	✓/✓	✓/✓
Built-in FM Tuner (Y/N)	✗	✗	✗	✗	✗
<b>Build Quality</b>					
The Knobs	3.00	3.00	2.38	2.50	4.13
The Speaker Veils	2.63	3.50	2.88	3.50	4.00
The Speaker Stands	0.00	0.00	0.00	3.75	0.00
Overall Build Quality	2.63	3.00	3.13	4.00	3.88
<b>Performance (Out Of 40)</b>	<b>12.97</b>	<b>18.41</b>	<b>24.56</b>	<b>22.12</b>	<b>33.45</b>
In Game Sound: <i>Half-life 2</i>	3.63	3.13	1.88	2.63	4.38
<b>DVD Movie Test</b>					
<i>Fast And The Furious</i>	2.88	3.25	3.00	2.50	4.00
<i>Behind Enemy Lines</i>	2.13	2.88	3.25	2.75	4.25
<b>DVD-Audio</b>					
Treble/Vocal/Bass	2.25/1.875/2.5	3.75/3.875/3.125	3.625/3.75/2.625	2.875/2.5/3	4.125/4/4.375
<b>Music Test</b>					
<b>English Audio CD</b>					
Track 1 (Enigma)	1.00	2.13	3.25	3.25	4.13
Track 2 (Corrs)	1.25	2.50	3.25	2.50	4.25
<b>Hindi Audio CD</b>					
Contemporary Track ( <i>Aapki Kashish</i> )	1.13	1.63	3.50	2.50	4.00
Classical Track (Zakir Hussain)	1.00	2.00	2.75	3.13	3.75
<b>English MP3</b>					
Track 1 (Eagles)	1.00	2.50	3.13	3.25	4.50
Track 2 (Whitney Houston)	1.13	1.63	4.13	3.00	4.50
<b>Hindi MP3</b>					
Contemporary Track ( <i>Aashiq Banaya Aapne</i> )	0.88	2.00	3.88	2.75	4.50
Classical Track (Bhimsen Joshi)	1.00	2.13	2.63	2.75	3.63
<b>Special Frequency Test Files</b>					
50 Hz / 100 Hz / 250 Hz	0.875/1/1	0.75/1/1.25	1/1.125/2.25	3.375/3.5/1.75	4/4/3.875
500 Hz / 1000 Hz / 15000 Hz	1.5/2.625/3	1.5/2.375/2.875	2.75/3.125/3.5	1.625/1.375/1	4/4.25/4.375
<b>Power Handling Test</b>					
Ultimate Bass Test	1.38	1.25	2.00	3.50	3.63
Ultimate Treble Test	1.25	1.38	3.88	3.25	4.38
<b>Price Index (Out Of 25)</b>	<b>12.50</b>	<b>4.69</b>	<b>2.31</b>	<b>1.58</b>	<b>1.90</b>
<b>Price Rs</b>	<b>1200</b>	<b>3200</b>	<b>6500</b>	<b>9500</b>	<b>7900</b>
<b>Overall Score (Out Of 100)</b>	<b>35.63</b>	<b>33.84</b>	<b>33.90</b>	<b>40.83</b>	<b>50.06</b>



+ Inexpensive  
- Poor performance



+ Mediocre performance  
- Plastic body





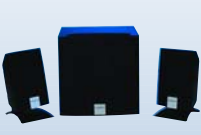
+ Good for music  
- Unsuitable for gaming



+ Overall good performer  
- Expensive



+ Stellar performer  
- Slightly expensive

Artis S-101 6.37	Artis S-111R 3.55	Artis S-700 7.32	Creative Inspire 2500 9.15	Creative I-Trigue 3400 9.13	Creative SBS-370 6.18
NA/NA 40 Hz–20 KHz	12/8.5x2 50 Hz–20 KHz	NA/NA 30 Hz–20 KHz	NA/NA NA	24/8.5x2 30 Hz–20 KHz	11/5x2 40 Hz–20 KHz
✓ ✗	✓ ✗	✓ ✗	✓ ✗	✓ ✗	✓ ✗
✓/✗/✓ ✗ ✗	✗/✗/✓ ✗ ✗	✓/✗/✓ ✗ ✗	✓/✗/✓ ✗ ✗	✓/✗/✓ ✗ ✗	✗/✗/✓ ✗ ✗
✗ ✗ ✗ ✗/✗ ✗	✗ ✗ ✗ ✓/✗ ✗	✗ ✗ ✗ ✗/✗ ✗	✗ ✗ ✗ ✗/✗ ✗	✗ ✗ ✗ ✓/✗ ✗	✗ ✗ ✗ ✓/✗ ✗
2.38 2.38 0.00 2.13 <b>15.60</b> 2.13	2.25 0.00 0.00 2.50 <b>12.97</b> 1.88	2.13 2.13 2.50 2.88 <b>16.95</b> 1.63	2.00 2.13 2.38 2.50 <b>10.56</b> 1.38	3.38 0.00 4.00 3.63 <b>22.72</b> 3.75	2.63 2.50 2.88 3.00 <b>14.87</b> 2.13
1.88 1.88	1.50 1.63	2.13 2.63	1.13 1.00	3.38 2.75	2.00 1.88
2.125/2.25/1.375	1.75/1.75/1.625	2/2.125/2.375	2.25/2.5/2.5	2.25/3/3.25	2.5/2.625/2.375
2.00 1.75	1.50 1.75	2.25 2.25	1.25 0.88	2.25 2.13	1.25 0.88
2.13 2.25	1.63 1.50	2.63 2.00	1.38 1.38	2.75 2.50	2.00 1.38
2.13 2.50	1.63 2.00	2.50 2.63	1.13 1.00	2.38 2.50	2.25 2.00
2.00 2.50	1.75 1.50	2.50 2.13	1.25 1.25	3.13 2.75	2.13 1.63
1.125/0.875/1 1.375/1/2	0.75/0.75/1.25 1.375/2.125/2.625	0.625/0.875/0.875 1.375/2.125/2.125	1/1/0.875 1.625/2/2.5	3/2.875/3.25 3.25/3.375/3.625	1.125/1.125/1.75 2.125/2.875/2.625
0.75 2.38 <b>12.00</b> <b>1250</b> <b>33.97</b>	0.63 1.50 <b>10.71</b> <b>1400</b> <b>27.24</b>	1.13 1.50 <b>4.62</b> <b>3250</b> <b>28.88</b>	1.00 1.00 <b>6.52</b> <b>2299</b> <b>26.24</b>	3.00 2.75 <b>2.17</b> <b>6900</b> <b>34.02</b>	1.25 1.13 <b>10.01</b> <b>1499</b> <b>31.05</b>
					
+ Inexpensive - Poor sound quality	+ Inexpensive - Poor sound quality	+ Decent for music - Weak bass	+ Moderately priced - Low on performance	+ Great looks, decent performance - Priced high	+ Inexpensive - Poor performance



Scoreboard		2.1 Speakers				
BRAND	Frontech	Genius	Gigabyte	Intex	Logitech	
MODEL	JIL-1811	sw-i2.1	GP-3A	IT-2600WP	X-230	
Features (Out Of 40)	11.23	7.06	2.87	9.62	10.47	
<b>Speaker Specifications</b>						
Power Rating (RMS)						
Subwoofer/Satellites	NA/NA	18/5x2	8/1.5x2	NA/NA	20/6x2	
Frequency Response	NA	20 Hz–20 KHz	70 Hz–18 KHz	NA	40 Hz–20 KHz	
<b>Connectors On Speaker Set</b>						
<b>Analog</b>						
Front In	✓	✓	✓	✓	✓	
Auxiliary	✗	✗	✗	✗	✗	
<b>Controls</b>						
Bass/Treble/Volume	✓/✓/✓	✗/✗/✓	✗/✗/✓	✓/✓/✓	✓/✗/✓	
Surround Effects	✗	✗	✗	✗	✗	
Others (List)	✗	✗	✗	✗	✗	
<b>Bundled Accessories</b>						
External Decoder	✗	✗	✗	✗	✗	
Power Adapter	✗	✗	✗	✗	✗	
Speaker Stands	✗	✗	✗	✗	✗	
Remote Control (Wired / Wireless)	✗/✗	✓/✗	✗/✗	✗/✗	✗/✗	
Built-in FM Tuner (Y/N)	✗	✗	✗	✗	✗	
<b>Build Quality</b>						
The Knobs	2.88	2.75	2.00	2.00	3.50	
The Speaker Veils	2.88	0.00	2.25	2.63	2.00	
The Speaker Stands	2.88	2.88	0.00	0.00	3.00	
Overall Build Quality	2.63	2.88	1.88	2.50	3.50	
<b>Performance (Out Of 40)</b>	<b>10.96</b>	<b>9.23</b>	<b>10.00</b>	<b>12.96</b>	<b>21.62</b>	
In Game Sound: <i>Half-life 2</i>	1.38	1.88	0.63	0.88	3.25	
<b>DVD Movie Test</b>						
<i>Fast And The Furious</i>	2.25	1.13	1.63	1.38	3.00	
<i>Behind Enemy Lines</i>	2.25	1.38	1.88	1.50	3.75	
<b>DVD-Audio</b>						
Treble/Vocal/Bass	2.625/3/1.5	1.625/1.75/1.5	1.75/2/1.625	1.5/1.375/1.125	2.875/3.125/2.375	
<b>Music Test</b>						
<b>English Audio CD</b>						
Track 1 (Enigma)	1.00	1.00	1.25	2.25	2.25	
Track 2 (Corrs)	0.75	1.00	1.38	2.00	2.25	
<b>Hindi Audio CD</b>						
Contemporary Track ( <i>Aapki Kashish</i> )	1.13	0.88	1.50	1.38	2.75	
Classical Track (Zakir Hussain)	1.25	1.75	1.00	1.38	2.13	
<b>English MP3</b>						
Track 1 (Eagles)	1.13	0.75	1.13	2.38	2.50	
Track 2 (Whitney Houston)	1.00	0.88	1.38	2.38	2.25	
<b>Hindi MP3</b>						
Contemporary Track ( <i>Aashiq Banaya Aapne</i> )	1.13	0.88	1.38	1.25	3.00	
Classical Track (Bhimsen Joshi)	1.50	1.25	1.13	1.50	2.00	
<b>Special Frequency Test Files</b>						
50 Hz / 100 Hz / 250 Hz	0.375/0.625/0.75	0.75/0.75/0.75	0.5/0.5/0.625	1/1/1.375	2.125/2.75/3	
500 Hz / 1000 Hz / 15000 Hz	1.125/1.625/2.25	1.125/1.625/2.125	1.25/2/0.75	2.125/2.5/2.75	3.125/3.25/3.5	
<b>Power Handling Test</b>						
Ultimate Bass Test	0.75	0.63	0.50	1.00	1.63	
Ultimate Treble Test	1.25	0.50	0.75	1.25	3.13	
<b>Price Index (Out Of 25)</b>	<b>12.50</b>	<b>11.28</b>	<b>11.54</b>	<b>9.38</b>	<b>5.01</b>	
<b>Price Rs</b>	<b>1200</b>	<b>1330</b>	<b>1300</b>	<b>1600</b>	<b>2995</b>	
<b>Overall Score (Out Of 100)</b>	<b>34.69</b>	<b>27.57</b>	<b>24.41</b>	<b>31.95</b>	<b>37.09</b>	



+ Inexpensive  
- Poor performance, shoddy build quality



+ Decent looks  
- Poor performance



+ Inexpensive  
- Weak performance



+ Decent for music  
- Not suitable for gaming



+ Good overall performer  
- None in particular

Logitech Z-2300 12.39	Philips MMS171FM 6.82	Philips MMS177FM 9.07	Philips MMS430 6.19	Tech-Com SSD-801 12.56	Tech-Com SSD-901R 13.96
120/40x2 35 Hz-20 KHz	8/5.5x2 35 Hz-20 KHz	12/6x2 35 Hz-20 KHz	30/10x2 NA	20/10x2 30 Hz-20 KHz	20/10x2 30 Hz-20 KHz
✓	✓	✓	✓	✓	✓
✗	✗	✗	✗	✓	✓
✓/✗/✓	✗/✗/✓	✓/✗/✓	✓/✗/✓	✓/✓/✓	✓/✓/✓
✗	✗	✗	✗	✗	✗
✗	✗	✗	✗	✗	✗
✗	✗	✗	✗	✗	✗
✗	✗	✗	✗	✗	✗
✗	✗	✗	✗	✗	✗
✓/✗	✗/✗	✗/✗	✗/✗	✗/✗	✗/✗
✗	✓	✓	✗	✗	✗
3.75	1.88	2.25	1.88	1.88	1.88
3.00	2.75	2.13	1.75	2.50	2.50
2.00	2.00	1.00	0.00	2.75	2.75
4.13	2.50	1.50	3.00	2.50	2.50
<b>23.47</b>	<b>11.22</b>	<b>11.75</b>	<b>13.72</b>	<b>8.31</b>	<b>8.31</b>
2.13	1.50	1.63	2.63	1.25	1.25
4.00	2.00	1.88	2.75	1.38	1.38
4.38	1.88	1.88	2.50	1.25	1.25
3.875/4.25/4.25	1.25/1.625/1.75	1.625/1.625/1.25	1.25/1.75/2.125	1/0.875/1	1/0.875/1
2.63	1.50	1.13	1.63	1.00	1.00
2.63	1.50	0.88	1.50	0.75	0.75
2.50	1.63	1.13	1.13	1.00	1.00
2.25	2.75	1.75	1.75	1.00	1.00
2.75	1.63	1.38	1.00	1.00	1.00
2.88	2.00	2.13	2.13	1.13	1.13
2.63	2.13	1.38	1.25	1.00	1.00
2.25	1.75	1.50	1.25	1.00	1.00
1.875/2/2.125	1.125/1/1	1.375/1.25/1.25	1.125/1/1.25	0.375/0.375/0.75	0.375/0.375/0.75
3.375/3.5/3.875	1.75/2.375/2.5	1.625/1.375/2.25	1.5/2.25/2.625	0.875/1.375/2.125	0.875/1.375/2.125
2.38	1.25	0.75	0.63	0.88	0.88
3.63	1.75	0.75	1.88	0.88	0.88
<b>1.50</b>	<b>6.85</b>	<b>5.38</b>	<b>5.02</b>	<b>17.67</b>	<b>14.30</b>
<b>9995</b>	<b>2190</b>	<b>2790</b>	<b>2990</b>	<b>849</b>	<b>1049</b>
<b>37.36</b>	<b>24.89</b>	<b>26.20</b>	<b>24.92</b>	<b>38.53</b>	<b>36.57</b>
					
+ Strong bass, build quality - Overpowered treble	+ FM tuner - Lacks punch	+ FM tuner - Lacks punch	+ None in particular - Poor music playback	+ Inexpensive - Poor music quality	+ Inexpensive - Poor music quality

Scoreboard		2.1 Speakers				
BRAND	Umax	Xfree	Xfree	Zebronic	Zebronic	
<b>MODEL</b>	<b>Powerbeats UPB 980</b>	<b>XE222</b>	<b>XE233</b>	<b>ZEB-1400W</b>	<b>ZEB-SW8000</b>	
<b>Features (Out Of 40)</b>	<b>4.43</b>	<b>4.41</b>	<b>4.41</b>	<b>8.76</b>	<b>3.16</b>	
<b>Speaker Specifications</b>						
Power Rating (RMS)						
Subwoofer/Satellites	6/1x2	4/2.5x2	10/5x2	50/25x2	30/15x2	
Frequency Response	60 Hz–18 KHz	50 Hz–20 KHz	45 Hz–20 KHz	NA	35 Hz–18 KHz	
<b>Connectors On Speaker Set</b>						
<b>Analog</b>						
Front In	✓	✓	✓	✓	✓	
Auxilliary	✗	✗	✗	✗	✗	
<b>Controls</b>						
Bass/Treble/Volume	✓/✗/✓	✗/✗/✓	✗/✗/✓	✓/✗/✓	✗/✗/✓	
Surround Effects	✗	✗	✗	✗	✗	
Others (List)	✗	✗	✗	✗	✗	
<b>Bundled Accessories</b>						
External Decoder	✗	✗	✗	✗	✗	
Power Adapter	✗	✗	✗	✗	✗	
Speaker Stands	✗	✗	✗	✗	✗	
Remote Control (Wired / Wireless)	✗/✗	✓/✗	✓/✗	✓/✗	✗/✗	
Built-in FM Tuner (Y/N)	✗	✗	✗	✗	✗	
<b>Build Quality</b>						
The Knobs	1.00	2.00	2.00	2.38	1.50	
The Speaker Veils	0.75	2.00	2.00	2.50	2.38	
The Speaker Stands	0.00	0.00	0.00	2.50	0.00	
Overall Build Quality	1.00	2.50	2.50	2.25	3.00	
<b>Performance (Out Of 40)</b>	<b>4.13</b>	<b>15.86</b>	<b>17.30</b>	<b>8.33</b>	<b>15.20</b>	
In Game Sound: <i>Half-life 2</i>	0.25	2.00	1.88	0.50	1.63	
<b>DVD Movie Test</b>						
<i>Fast And The Furious</i>	0.50	1.88	2.25	0.75	2.50	
<i>Behind Enemy Lines</i>	0.38	1.38	2.13	0.88	2.25	
<b>DVD-Audio</b>						
Treble/Vocal/Bass	0.5/0.625/0.375	2.375/3/2.625	2/2.875/2.25	0.875/1.125/0.5	2.25/2/2	
<b>Music Test</b>						
<b>English Audio CD</b>						
Track 1 (Enigma)	0.50	2.63	2.00	1.63	1.50	
Track 2 (Corrs)	0.25	1.25	1.63	1.50	2.13	
<b>Hindi Audio CD</b>						
Contemporary Track ( <i>Aapki Kashish</i> )	0.63	1.63	2.13	0.63	2.13	
Classical Track (Zakir Hussain)	0.75	1.50	1.50	0.63	2.00	
<b>English MP3</b>						
Track 1 (Eagles)	0.50	2.75	2.38	1.75	1.75	
Track 2 (Whitney Houston)	0.75	2.75	3.25	0.88	2.13	
<b>Hindi MP3</b>						
Contemporary Track ( <i>Aashiq Banaya Aapne</i> )	0.50	1.75	2.50	0.75	2.50	
Classical Track (Bhimsen Joshi)	0.75	1.50	1.63	0.63	2.13	
<b>Special Frequency Test Files</b>						
50 Hz / 100 Hz / 250 Hz	0.25/0.375/0.25	0.75/1.375/1.75	0.625/1.5/1.75	1.375/1.5/1.5	0/1/1.125	
500 Hz / 1000 Hz / 15000 Hz	0.75/1/1.375	2.25/2.875/3.375	2.125/2.25/3	1.75/2.375/2.625	1.75/3/2	
<b>Power Handling Test</b>						
Ultimate Bass Test	0.25	0.63	1.88	1.63	0.25	
Ultimate Treble Test	0.25	1.50	2.75	1.13	1.00	
<b>Price Index (Out Of 25)</b>	<b>25.00</b>	<b>10.00</b>	<b>8.33</b>	<b>17.14</b>	<b>6.82</b>	
<b>Price Rs</b>	<b>600</b>	<b>1500</b>	<b>1800</b>	<b>875</b>	<b>2200</b>	
<b>Overall Score (Out Of 100)</b>	<b>33.56</b>	<b>30.27</b>	<b>30.04</b>	<b>34.23</b>	<b>25.18</b>	



+ Very low-priced  
- Worst performer



+ Inexpensive  
- Lacks punch



+ Low price  
- None in particular



+ Very low-priced  
- Weak performance



+ Good value for money  
- Weak performer

Scoreboard	4.1 Speakers		
BRAND	Creative Inspire	Frontech	Intex
MODEL	4400	JIL-1867	IT-2880W
Features (Out Of 40)	11.91	13.69	9.85
<b>Speaker Specifications</b>			
Power Rating (RMS)			
Subwoofer/Center/Satellites	17/NA/6x4	NA/NA/NA	18/NA/8x4
Frequency Response	40 Hz-20 KHz	20 Hz-20 KHz	20 Hz-20 KHz
Decoder/Amplifier	None	None	None
<b>Connectors On Speaker Set</b>			
Digital DIN	✘	✘	✘
Auxiliary	✘	✘	✘
Coaxial/Optical In	✘/✘	✘/✘	✘/✘
<b>Controls Provided</b>			
Bass/Treble/Volume	✘/✘/✓	✓/✓/✓	✓/✓/✓
Surround Effects	✘	✘	✘
Others (List)	✘	Balance	✘
<b>Bundled Accessories</b>			
External Decoder	✘	✘	✘
Power Adapter	✘	✘	✘
Speaker Stands	✘	✘	✘
Remote Control (Wired / Wireless)	✘/✘	✘/✘	✘/✘
Batteries	NA	NA	NA
Built-in FM Tuner (Y/N)	✘	✘	✘
<b>Build Quality (So5)</b>			
The Knobs	2.00	2.13	1.63
The Speaker Veils	2.38	2.00	0.88
The Speaker Stands	1.75	0.00	0.00
Overall Build Quality	2.63	2.38	1.38
<b>Performance (Out Of 45)</b>			
In Game Sound: <i>Half-life 2</i>	1.13	1.50	1.75
<b>DVD Movie Test</b>			
<i>Fast And The Furious</i>	1.13	2.00	1.00
<i>Behind Enemy Lines</i>	1.25	1.50	1.13
DVD-Audio: Treble/Vocals/Bass	1.375/1.25/1.125	1.625/1.75/1.375	1.125/1.25/1.125
<b>English Audio CD</b>			
Track 1 (Enigma)	1.25	1.63	1.13
Track 2 (Corrs)	0.63	1.25	0.88
<b>Hindi Audio CD</b>			
Contemporary Track ( <i>Aapki Kashish</i> )	0.88	1.50	1.00
Classical Track (Zakir Hussain)	1.88	2.00	1.38
<b>English MP3</b>			
Track 1 (Eagles)	0.88	1.88	1.00
Track 2 (Whitney Houston)	1.25	1.50	0.88
<b>Hindi MP3</b>			
Contemporary Track ( <i>Aashiq Banaya Aapne</i> )	0.38	1.25	0.75
Classical Track (Bhimsen Joshi)	0.88	1.13	0.88
<b>Special Frequency Test Files</b>			
50 Hz / 100 Hz / 250 Hz	1.625/1.5/1	1.75/1.625/1.375	1/1/1
500 Hz / 1000 Hz / 15000 Hz	1.75/2.5/0	1.75/1.875/2.75	0.625/0.75/1.5
<b>Power Handling Test</b>			
Ultimate Bass Test	1.25	0.88	1.00
Ultimate Treble Test	1.25	1.38	1.38
<b>Price Index (Out Of 20)</b>	<b>14.05</b>	<b>20.00</b>	<b>18.75</b>
<b>Price Rs</b>	<b>2990</b>	<b>2100</b>	<b>2240</b>
<b>Overall Score (Out Of 100)</b>	<b>35.84</b>	<b>47.79</b>	<b>38.27</b>

 <p>+ Good build quality - Poor performance</p>	 <p>+ Low price - None in particular</p>	 <p>+ None in particular - Poor sound quality</p>
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**Sound Card Matters**

Now that you've got that set of speakers you've always wanted, what else is stopping you from turning that PC into a digital entertainment station? It's the sound solution a.k.a. the soundcard.

Another decision to be made is whether to invest in a discrete add-on soundcard or to utilise the Onboard Sound solution. Onboard sound is simply the audio controller that is part of the motherboard you purchase. A few years back any user remotely interested in decent sound would go with an add-on soundcard as onboard solutions just couldn't keep up.

Onboard sound has improved phenomenally and industry players like ALC and C-Media have been working hard at reducing the need to invest in an add-on soundcard. Intel has developed 'Azalia', an HD audio specification, capable of playing back more audio channels, (8 channels), at higher sound quality than other audio formats. What this means is sound with all its bells and whistles!

If you want immersive gaming and movies, and want your MP-3 playback to be truly spectacular an onboard solution just may not cut the ice. Onboard solutions as mentioned above are decent performers and nothing more. They cannot compare to a decent soundcard let alone a high end one for obvious reasons - they're integrated, to keep costs down!

The choice of whether, or not you need a soundcard is more or less up to your ears! An expensive speaker set can only do so much after all, without proper accompaniments. A entry level 4 channel soundcard costs around a thousand rupees and the higher end ones could set you back by as much as 25 grand! Generally a good buy is somewhere in-between with the decent 6 channel sets costing around Rs. 5000/-.

**2.1 Or Surround Sound—What do you really need?**

As you try to decide which speaker is best for you, a fundamental consideration is the primary intended use. Define your usage patterns first—are you an audiophile, does music occupy seventy five or more percent of your ‘speaker usage time’? Are you going to be using your speakers solely for movie watching with an occasional game?

The fact is, 2.1 speakers are ideally suitable for music, even more so than a 5.1 system. More does not necessarily mean better, and a good 2.1 set will outperform a similar priced 5.1 as far as those MP3s and audio CDs go. This is because all music today (5.1 DVD tracks being an exception) is encoded for two channel playback. A 2.1 speaker system can therefore pan and split the sound to its left and right channel easily and with minimum signal loss. 5.1 speakers have a more complex method of distributing sound to various channels and are not suitable for music. This doesn’t mean that they won’t play music well; but for the price of a decent 5.1 speaker you can get a really good 2.1 which will offer far more bang for your buck. So if its music you crave for, then it’s 2.1 you need!

A 5.1 setup excels at movies (especially DVD movies) and games. This is because the positioned speakers put you right in the middle of the action. Standards such as DTS and Dolby Prologic IIx make it a must to have a 5.1 system to accompany those DVD movies if you want to experience the movie the way the film makers intended. For gamers standards such as EAX Advanced HD ensure gripping game-play and realism. A 2.1 system just cannot give you the sheer immersive experience that a 6-channel setup can. For the movie buff/game freak the choice is clear—it’s the 5.1 way, or the highway.

The Umax PowerBeats UPB 980 and the Gigabyte GP-3A could not handle the test and produced almost no bass. The Altec Lansing MX-5021, Altec Lansing FX-6021 and the Creative I-Trigue 3400 were the best performers here and produced rich bass. This was expected due to their large woofer drivers and their well-ported subwoofer.

The extreme treble under this test was comfortably handled by the Altec Lansing MX-5021, the Altec Lansing CS21, and the Logitech Z-2300. The Umax PowerBeats UPB 980 could not keep up in this test as well.

**5.1: SURROUNDED BY SOUND**

While a decent 2.1-channel speaker set is enough for most folks, when it comes to games and a home theatre-like movie experience, a quality 5.1 channel solution would be a better choice. A 5.1 set can make a DVD come alive, and hardcore gamers should settle for nothing less.

The 5.1 segment is exciting because of the sheer variety of models available. The best (and sometimes unorthodox) looking speakers are usually found here. Falling prices mean that a 5.1 is well within most people’s reach. We received 15 such sets from 10 manufacturers. The prices, when compared, show that some 5.1 sets are actually cheaper than certain 2.1 sets. Less money, more sound!

**A Look At Features**

5.1 speaker sets are generally loaded with features. Their build

quality is also expected to be better in general. Most of the manufacturers didn’t disappoint.

Multiple inputs lacked in the case of most of the speakers. Only the Creative Inspire GD580 and the Logitech Z-5500D had more than one input option, with the inclusion of coaxial and optical inputs. None of the speakers had S/PDIF inputs.

Most of the 5.1s had some form of remote control—either a wired control pod or a wireless IR remote. Some had both; the Logitech Z-5500D comes to mind. It had a sleek control pod cum decoder. The Altec Lansing 151i and 251i and the Techcom SSD-2001 disappointed with no form of remote control whatsoever—unacceptable for a home theatre setup.

Most 5.1 speakers depend on the sound card to split sound into the six discrete channels. We gave extra points to speakers that had their own external decoders.

The Creative Inspire GD580, Logitech Z-5500D, Techcom SSD-

2001, Philips HTR5000 and the Artis S6600R all came with external decoder/splitter boxes. Among these, the Logitech Z-5500D was notable: its decoder was capable of a sampling rate of 96 KHz at 24-bit quality. The Creative Inspire GD580 and Logitech Z5500D were the only two sets that were fully THX-certified.

The process of setting up a 5.1 speaker system can sometimes be a pain, because of the sheer number of wires involved. Some users prefer plugs to the clamp system because it’s cleaner to set up. With the clamp system, one actually has to ensure that the clamp makes contact with the actual wires and not the insulation.

However the clamp system has one inherent advantage. As most people know, the sound quality depends to a great extent on the quality of wires, and if one feels the quality of the cables doesn’t match the speakers, the option of an upgrade to better-quality, higher grade wires is always there.

With plug connectors, an upgrade becomes a problem. Moreover, if any of the speaker cables get damaged with the plug-type connectors, replacements will always be a problem.

Cable quality was decent throughout the 5.1 range; nothing spectacular, but no gripes either. Looks like manufacturers have finally understood that bad-quality cables tremendously hamper performance.

We faced a peculiar problem while setting the Frontech JIL-1875 speakers: the colour coding for the centre speaker and subwoofer were found to be reversed. This was quite irritating, because the subwoofer kept playing bass for the centre channel until we remedied this by simply swapping the wires. Color coding is supposed to make setting up easy? Quite the opposite here!

We were blown away by the enormous size of the Logitech Z-5500D’s subwoofer, and we thought its carton was huge! The subwoofer with its massive 10-inch driver (the largest subwoofer we’ve received to date) was heavy too, and it took two people to lift it out of its box! Its control pod cum decoder with its cool blue backlit LCD panel was also a plus.

The Philips HTR5000 looked rather sexy with its narrow subwoofer and satellites with horn-like micro drivers. The decoder box



Altec Lansing FX-6021

## Demystifying the channels

The nomenclature 2.1, 4.1, and 5.1 denotes the number of channels of sound that a speaker can reproduce. Simply put, the number of satellites is represented by the figure before the dot, and the subwoofer—which is almost always 1—after it.

A 2.1 speaker set will have two sound channels, and two satellites and a woofer. A 4.1 set similarly implies four speakers (two front and two rear) and a woofer. The term 5.1 denotes a 6-channel setup with five satellites (two front, two rear and a centre) and a woofer. Similarly, a 7.1 system will have seven satellites and one woofer. There are also systems that have two woofers; in case of a 6-channel setup, this would be shown as a 5.2 setup. However, such systems for computers are extremely rare.

actually looked like a slim DVD player at first glance, and we did a double take just to be sure.

Two 5.1 speakers sported tower speakers—the Genius GHT-S200 with a silver and black finish, and the Zebronic ZEB-SW12000R in a complete metallic silver and chrome finish. Incidentally, these two models sported tall subwoofers that were sized on par with a mid-sized computer cabinet.

Altec Lansing's GT-5051R surprised us when we found only three satellites amongst the packing. We were surprised to see that this model integrates the rear speakers with the front speakers itself, but with a different direction of fire. Altec Lansing calls this "Side Firing Dipole technology." Just three satellites for a 5.1 setup is something unique—space-conscious users, take note!

## Sounding Off

We fired up the *HalfLife 2* demo to check out the gaming performance of these beauties. The Artis S6600R was a clear winner here, surprisingly, considering its overall power. Its bass reproduction was good, and the voice commands of the squad could be easily heard above all the gunfire and explosions. The Philips HTR5000 was a distant second while the Logitech Z-5500D was close on its heels at third place.

The Frontech JIL 1875 and the Zebronic ZEB-SW12000R brought up the rear with the lowest scores in the gaming segment.

Coming to the DVD tests, the Philips HTR5000 topped both the tests with clear sound and hardly any discernable distortion. The bass was flat and the highs and ambient background sounds faithfully reproduced. The Artis S6600R came in second, with the second-best overall scores.

Also worthy of a mention are the Creative Inspire GD580, Philips

MMS 5.500 i/C and the Logitech Z-5500D which produced some decent scores. The GD 580 basically lacked the bass punch necessary, owing to its lower RMS rating. The Z-5500D was quite the opposite: the 187-watt RMS subwoofer overpowered everything else and the explosions in the movie rocked us, but the bass tended towards rumbling and wasn't as tight as we'd have liked it to be.

The lowest scorers in this segment were for the Frontech JIL-1875 and the Intex IT-4900W. There was a lot of distortion, especially in the high-pitched sounds. Bass was also below par and explosions sounded flat. Not recommended for DVD viewing!

The DVD test track was tested for treble, vocals and bass, and the undisputed winner was the Logitech Z-5500D. This speaker set left the others biting the dust. The closest rivals were the two Philips siblings the HTR5000 and the MMS 5.500 i/C, in that order.

The Frontech JIL-1875 sounded pathetic in the DVD audio test, with some of the lowest scores ever recorded. The Altec Lansing GT-5051R also could not handle this test and posted some low scores. A surprise bad performer here was the Creative Inspire GD580; it just didn't impress.

Next, we decided to stress-test the 5.1s with our frequency tests. These tests stress the speakers because they contain sounds of a particular frequency played continuously.

The 50 Hz test was won by the the Logitech Z-5500D with a near-



## 4.1—A Dying breed

This time round we received just three 4.1 speakers to test. Certain large vendors such as Logitech and Altec Lansing have done away with the 4.1 product line almost entirely. There is a strong technical reason for this. Let us explain.

4.1 speakers are of two types—true 4.1 and pseudo 4.1. A true 4.1 speaker set has four channels and a subwoofer that derives low frequency sounds from the front two channels. Pseudo 4.1s have four satellites but actually have just two channels, and the rear speakers and woofer do not have discrete sound channels. A Pseudo 4.1 is therefore nothing more than a 2.1 with two extra speakers. In movies supporting Dolby surround, a 4.1 will not be able to deliver accurate positional sound.

Coming to the gaming segment where EAX rules, 4.1 is once again a big no-no.

A 4.1 is therefore not suitable for either the music or gaming/DVD segment, which is better served by 2.1 and 5.1 systems respectively.

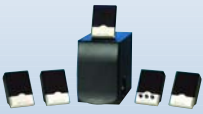



For those of you still hanging on to that old SoundBlaster 4.1 channel sound card, we tested the three 4.1s (two sets out of these were "Pseudo sets"). The Creative Inspire 4400 surprisingly lost out badly and was placed last. Sadly this was the only "true 4-channel speakers" of the lot. The winner among these bad boys (pun intended) was the Frontech JIL 1867. The other contender the Intex IT 2880W was marginally better in *Half Life 2*.







For music playback, the Frontech JIL 1867 came out tops. In case you

absolutely must have a 4.1 for whatever reason, this is your best bet.

For an overall picture, it must be said that the 4.1s are worse than the smaller 2.1 sets, and don't even come close to 5.1 territory.

4.1 sets were originally meant to be a cheap replacement to the discrete six-channel 5.1s, which were costly up until a few years ago. Today, the cost of an entry level 5.1 speaker set is just a couple of thousand rupees more than a similar 4.1 set. Anyone wanting a surround sound experience is, in our opinion, better served by investing a bit more in a 5.1 system. We feel the number of 4.1s we received as compared to the other categories speak volumes about good old "Pseudo Surround." R.I.P.!

Scoreboard		5.1 Speakers			
BRAND	Altec Lansing	Altec Lansing	Altec Lansing	Artis	
MODEL	151i	251i	GT-5051R	56600R	
Features (Out Of 40)	9.14	10.71	10.90	11.41	
<b>Speaker Specifications</b>					
Power Rating (RMS)					
Subwoofer/Center/Satellites	12/4.5/4.5x4	NA/NA/NA	30/10/10x4	NA/NA/NA	
Frequency Response	30 Hz–20 KHz	35 Hz–18 KHz	40 Hz–20 KHz	25 Hz–20 KHz	
Decoder/Amplifier	None	None	None	Amplifier	
<b>Connectors On Speaker Set</b>					
Digital DIN	✘	✘	✘	✘	
Auxiliary	✘	✘	✓	✓	
Coaxial/Optical In	✘/✘	✘/✘	✘/✘	✘/✘	
<b>Controls Provided</b>					
Bass/Treble/Volume	✘/✘/✓	✘/✘/✓	✘/✘/✓	✘/✘/✓	
Surround Effects	✘	✘	✘	✘	
Others (List)	Volume controls for rear and subwoofer	Volume controls for front, rear and subwoofer	Volume controls for subwoofer, centre and surround	Individual speaker volume control, input selection	
<b>Bundled Accessories</b>					
External Decoder	✘	✘	✘	✘	
Power Adapter	✘	✓	✘	✓	
Speaker Stands	✘/✘	✘/✘	✘/✓	✘/✓	
Remote Control (Wired / Wireless)	✘	✘	✓	✓	
Batteries	✘	✘	✘	✘	
Built-in FM Tuner (Y/N)					
<b>Build Quality (So5)</b>	1.75	2.00	3.38	2.75	
The Knobs	1.63	2.25	2.63	2.50	
The Speaker Veils	0.00	2.50	0.00	2.00	
The Speaker Stands	2.00	2.63	3.13	1.88	
Overall Build Quality	17.90	22.31	25.73	26.73	
<b>Performance (Out Of 45)</b>	<b>1.63</b>	<b>2.38</b>	<b>2.00</b>	<b>3.25</b>	
<b>In Game Sound: Half-life 2</b>					
DVD Movie Test	1.88	2.13	2.25	3.00	
<i>Fast And The Furious</i>	2.13	2.63	2.50	3.00	
<i>Behind Enemy Lines</i>	2/1.875/1.5	2.25/2.375/1.875	1.5/1.5/1.375	2.875/2.875/1.75	
<b>DVD-Audio: Treble/Vocals/Bass</b>					
English Audio CD	2.13	2.50	2.75	2.38	
Track 1 (Enigma)	1.50	2.38	2.75	2.63	
Track 2 (Corrs)					
Hindi Audio CD	1.88	2.25	2.88	2.00	
Contemporary Track ( <i>Aapki Kashish</i> )	2.25	2.63	3.13	2.13	
Classical Track (Zakir Hussain)					
English MP3	1.75	2.13	2.63	2.38	
Track 1 (Eagles)	1.63	2.50	2.13	2.63	
Track 2 (Whitney Houston)					
Hindi MP3	1.75	1.75	2.75	2.88	
Contemporary Track ( <i>Aashiq Banaya Aapne</i> )	2.13	2.63	2.13	2.88	
Classical Track (Bhimsen Joshi)					
<b>Special Frequency Test Files</b>					
50 Hz / 100 Hz / 250 Hz	1.125/1.625/1.875	1.875/2.125/2.125	3.625/3.5/3.375	3/2.875/3	
500 Hz / 1000 Hz / 15000 Hz	2.125/1.5/0.75	2.25/1.625/0.75	2.875/3.375/2.875	3/2.375/2.5	
<b>Power Handling Test</b>					
Ultimate Bass Test	1.50	2.00	3.63	3.00	
Ultimate Treble Test	1.88	2.13	3.38	2.75	
<b>Price Index (Out Of 20)</b>	<b>12.42</b>	<b>11.01</b>	<b>5.72</b>	<b>5.12</b>	
<b>Price Rs</b>	<b>3500</b>	<b>3950</b>	<b>7600</b>	<b>8500</b>	
<b>Overall Score (Out Of 100)</b>	<b>39.47</b>	<b>44.03</b>	<b>42.35</b>	<b>43.25</b>	
					
	+ Compact, low price - Low performance	+ Decent performance and price - Lacks punch	+ Decent performance, three satellites - High price	+ Good performance - Somewhat steeply priced	

Creative Inspire 5.1 5200 16.78	Creative Inspire GD580 25.89	Frontech JIL-1875 14.39	Genius GHT-S200 10.41	Intex IT-4900W 9.78	Logitech Z-5500D 17.27
17/6/6x4	17/6/6x4	30/20/20x4	100/20/20x4	25/8/8x4	188/69/62x4
40 Hz–20 KHz	40 Hz–20 KHz	45 Hz–18 KHz	30 Hz–20 KHz	25 Hz–20 KHz	33 Hz–20 KHz
None	DTS, Dolby Pro Logic II	None	None	None	DTS, Dolby Pro Logic II
✘	✓	✘	✘	✘	✘
✘	✓	✘	✓	✘	✘
✘/✘	✓/✓	✘/✘	✘/✘	✘/✘	✓/✓
✓/✘/✓	✓/✓/✓	✘/✓/✓	✘/✘/✓	✘/✘/✓	✘/✘/✓
✘	✘	✓	✘	✘	✘
None	Volume control for centre, front, rear and subwoofer	3D Mode, volume control for centre, front, rear and subwoofer	Individual volume controls for front, rear, centre & subwoofer	Volume controls for front, centre, rear & subwoofer	Volume controls for front, centre, rear and subwoofer
✘	✓	✘	✘	✘	✓
✓	✓	✘	✘	✘	✘
✓	✓	✘	✓	✘	✓
✓/✘	✘/✓	✘/✓	✘/✓	✘/✓	✓/✓
✘	✓	✓	✓	✓	✓
✘	✘	✘	✘	✘	✘
2.38	4.50	2.00	2.38	2.50	3.75
2.88	2.88	2.38	2.50	1.75	3.25
3.00	2.75	0.00	1.38	0.00	3.50
3.00	3.25	2.50	2.13	2.50	3.38
18.96	21.81	11.08	20.85	15.86	33.50
<b>1.88</b>	<b>1.88</b>	<b>1.50</b>	<b>2.00</b>	<b>1.75</b>	<b>2.25</b>
1.88	2.88	1.25	1.75	1.13	2.50
1.88	3.13	1.38	3.13	1.38	2.88
2.375/2.125/2.375	1.625/1.5/1.75	0.625/0.625/0.625	2.625/2.375/2.375	2/1.625/1.25	3.375/3.25/3.375
2.00	2.00	1.38	1.63	1.88	3.63
1.63	2.25	1.38	1.88	2.00	2.38
1.50	3.13	1.13	2.38	1.38	3.63
1.75	1.88	1.38	2.38	1.13	3.50
2.13	2.13	1.50	2.00	1.50	4.00
2.13	1.75	0.50	1.88	1.38	4.13
1.50	2.13	0.50	1.50	1.63	3.38
2.13	1.63	0.50	1.88	1.38	2.75
1.25/1.875/2	2/2.5/1.625	1/0.625/0.75	2.125/1.75/1.875	2.125/2/1.375	4.25/4.375/3.125
2/2.25/2.5	2/2.625/2.5	1/1.375/1.25	2.25/2.625/3	1.5/2/2.375	3.5/4/4
1.38	2.00	2.38	2.00	1.63	4.00
2.00	2.38	1.50	2.00	2.00	3.88
<b>9.27</b>	<b>2.90</b>	<b>10.87</b>	<b>2.42</b>	<b>10.43</b>	<b>1.55</b>
<b>4690</b>	<b>14990</b>	<b>4000</b>	<b>18000</b>	<b>4170</b>	<b>27995</b>
<b>45.02</b>	<b>50.60</b>	<b>36.34</b>	<b>33.68</b>	<b>36.07</b>	<b>52.33</b>
					
+ Small footprint - Low on performance	+ Decent performance, Dolby external decoder - Not worth the price	+ External box for connectors - Very poor performer	+ Sleek tower stands - Low on performance, grossly overpriced	+ Reasonably priced - Low on performance	+ Superb performance, build quality - Very expensive





Scoreboard		5.1 Speakers			
BRAND	Philips	Philips	Tech-Com	Zebronic	Zebronic
MODEL	MMS 5.500 i/C	HTR5000	SSD-2001	ZEB-SW10000R	ZEB-SW12000R
Features (Out Of 40)	20.58	23.45	13.79	10.96	17.58
Speaker Specifications					
Power Rating (RMS)					
Subwoofer/Center/Satellites	25/10/10x4	80/50/50x4	NA/NA/NA	NA/NA/NA	50/15/15x4
Frequency Response	40 Hz–20 kHz	40 Hz–20 kHz	NA	35 Hz–18 kHz	30 Hz–22 kHz
Decoder/Amplifier	None	DTS, Dolby Pro Logic II	Amplifier	None	None
Connectors On Speaker Set					
Digital DIN	✓	✓	✗	✗	✗
Auxiliary	✓	✓	✗	✗	✓
Coaxial/Optical In	✗/✗	✓/✓	✗/✗	✗/✗	✗/✗
Controls Provided					
Bass/Treble/Volume	✓/✓/✓	✓/✓/✓	✓/✗/✓	✗/✗/✓	✓/✓/✓
Surround Effects	✗	✗	✗	✗	✗
Others (List)	✗	✗	Volume controls for centre, rear and front	Volume controls for centre, rear, subwoofer and front	Volume controls for centre, rear, subwoofer and front, left and right volume balance.
Bundled Accessories	✓	✓	✓	✗	✗
External Decoder	✗	✗	✗	✗	✗
Power Adapter	✗	✗	✓	✓	✓
Speaker Stands	✗/✓	✗/✓	✗/✗	✗/✓	✗/✓
Remote Control (Wired / Wireless)	✓	✓	✗	✗	✓
Batteries	✓	✓	✗	✗	✗
Built-in FM Tuner (Y/N)					
Build Quality (So5)	2.25	3.63	2.50	2.25	2.50
The Knobs	2.00	3.38	1.88	2.50	2.25
The Speaker Veils	0.00	0.00	0.88	2.38	3.13
The Speaker Stands	2.38	3.50	2.00	2.75	2.88
Overall Build Quality	26.64	26.73	18.66	20.96	20.00
Performance (Out Of 45)	1.75	2.38	1.75	1.88	1.50
In Game Sound: <i>Half-life 2</i>					
DVD Movie Test	2.75	3.38	1.63	1.88	2.13
<i>Fast And The Furious</i>	2.88	3.75	2.13	2.00	2.38
<i>Behind Enemy Lines</i>	3.25/3/2.75	3.5/2.5/2.875	2.125/1.875/1.625	1.625/1.625/1.875	2.25/2.25/2.25
DVD-Audio: Treble/Vocals/Bass					
English Audio CD	2.88	3.25	2.00	2.50	2.63
Track 1 (Enigma)	2.13	2.25	1.63	2.38	2.25
Track 2 (Corrs)					
Hindi Audio CD	2.13	2.13	1.88	2.25	1.88
Contemporary Track ( <i>Aapki Kashish</i> )	2.75	2.13	3.00	2.00	1.63
Classical Track (Zakir Hussain)					
English MP3	3.00	3.50	2.25	2.63	2.50
Track 1 (Eagles)	3.38	2.50	0.88	2.00	2.25
Track 2 (Whitney Houston)					
Hindi MP3	3.38	2.38	1.63	2.25	1.63
Contemporary Track ( <i>Aashiq Banaya Aapne</i> )	2.63	1.38	1.00	2.13	1.75
Classical Track (Bhimsen Joshi)					
Special Frequency Test Files					
50 Hz / 100 Hz / 250 Hz	1.5/2/2.25	1.5/2.375/2.75	2.25/2.25/1.625	2.25/2.375/1.625	1.125/2/0.625
500 Hz / 1000 Hz / 15000 Hz	2.125/2.375/3	3.125/3.125/3.625	1.875/2.25/2.625	2/2.125/1.5	1.75/2.5/2.75
Power Handling Test					
Ultimate Bass Test	2.38	2.00	2.50	1.88	1.00
Ultimate Treble Test	2.75	2.50	2.38	2.00	2.00
Price Index (Out Of 20)	8.71	3.35	15.00	11.15	4.48
Price Rs	4990	12990	2899	3900	9700
Overall Score (Out Of 100)	55.93	53.52	47.45	43.08	42.06



+ Good value and decent performer  
- None in particular



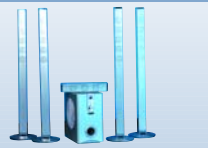
+ Overall good performer  
- Above average price



+ Inexpensive  
- Low performance



+ Cool looking satellites  
- Mediocre performer



+ Tower stands, good aesthetics  
- Low performance

perfect score. The Altec Lansing GT-5051R also deserves a mention here. Coming to the mid and high frequencies, the verdict was once again in favour of Logitech—the Z-5500D demolished everything in its path. The Altec Lansing GT-5051R also performed well and came in a solid second. The Frontech JIL-1875 was once again trounced with below par scores.

We fired up the power handling tests next. We plugged in the Logitech Z-5500D first. After 10 minutes of listening to it, it was clear that this set was going to be hard to beat. The only speaker to come anywhere near the Logitech was the Altec Lansing GT-5051R.

The Zebronics ZEB-SW12000R and the Creative Inspire 5200 just could not keep up with the rest and posted the lowest scores. The Zebronics ZEB-SW10000R and the Intex IT-4900W did marginally better. A lot was expected from the Philips HTR5000, but it failed to deliver here.

Finally, some music! We did the audio CD tests first. No surprise, the Logitech Z-5500D once again went about its business ruthlessly, beating every speaker hollow in three out of the four audio CD tests—second place was a more closely contested affair. Most of the 5.1s did decently well in this test with average scores. The two Philips models (the HTR5000 and the MMS 5.500 i/C) did well here. Altec Lansing's GT-5051R and the 251i, the Artis S6600R and Creative's Inspire GD580 also deserve a mention.

The unpopular battle for last spot was also a closely contested affair—between the Intex IT-4900W and the Frontech JIL-1875.

The final test was the MP3 music: we played the evergreen *Hotel California* first. The Logitech Z-5500D made it sound like an Eagles concert. Even at high volumes there was barely any

distortion, and with this set, your ears start to protest before the speakers do. These speakers are very loud, and the 500-watt RMS label is very believable.

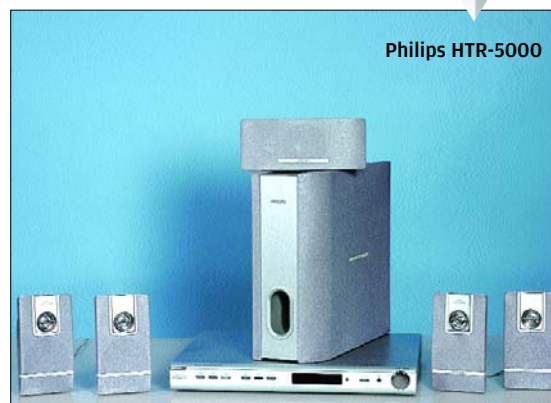
The Z-5500D took two out of the four tests outright, and tied for the third. The Philips MMS 5.500 i/C took second spot with the Artis S6600R. Another worthy mention here is the Philips HTR5000.

The Frontech JIL-1875 once again occupied bottom position proving that these aren't performance oriented at all.

### Putting It All Together

We saw some strong performers emerge and other speakers get thrashed once subjected to our rigorous testing standards.

There is no clear choice for all users. The Altec Lansing MX-5021 performed superlatively in nearly all the tests it was subjected to, but it would be



hard to recommend to a casual music listener when cheaper 5.1 systems are available. For an audiophile who wants good music on his computer and wants sound as close to the original as possible, the MX-5021 is the speaker for you. Even after taking into account its considerably high price tag of Rs 7,900, the Altec Lansing came on tops in the 2.1 category leaving the

closest competition, its higher priced sibling Altec Lansing FX-6021, behind by miles. We did not need to have a second look before deciding that the Altec Lansing MX-5021 be awarded a well-deserved Digit Best Buy Gold. The Altec Lansing FX-6021, which did not perform too badly either, came in second and was awarded the Digit Best Buy Silver.

Coming to the 6 channels sets, for users with no budget constraints, we'd recommend the Logitech Z-5500D. This 500-watt monster rocked our labs with its front firing 10-inch woofer. It topped the performance charts in 70 per cent of the tests we put it through. Although the Z-5500D was by far the costliest speaker set of the lot, performance is guaranteed, and, oh, let's not forget the flaunt value!

We don't all have deep pockets, however, and for users looking to dabble in a bit of surround sound at an affordable price tag, the Artis S6600R and the Altec Lansing GT-5051R are good choices—they perform well and don't cost a bomb. Going even further down the price range, we recommend the Altec Lansing 251i—5.1 for under Rs 4K!

At the end of the day, a perfect combination of low price, good features and performance is what goes into deciding the winner. The Philips MMS 5.500 i/C did not fare poorly in any of the tests and was more or less an average performer. With an inbuilt FM radio and decent looks, it's sure to appeal to a wide audience. Add to all that a cost of just Rs 4,990, which is peanuts for a 5.1 speaker set, the Philips MMS 5.500 i/C was adjudged the winner of the Digit Best Buy Gold award.

Even though the Philips HTR5000 was priced much higher at Rs 12,990, it performed well in most of the tests thrown at it. It sports good looks, has an inbuilt FM radio and also has a decoder for DTS and Dolby Pro Logic II, because of which, watching (or rather listening to) compatible DVDs is a whole new experience! We found that the price of Rs 12,999 was not too much for a decently-performing 5.1 speaker set with so many features, and therefore, the Digit Best Buy Silver for this category goes to the Philips HTR5000! ☑

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michael\_browne@thinkdigit.com

Contact Sheet		Speakers		
Brand	Company	Phone	E-mail	Web Site
Altec Lansing	Rashi Peripherals	022-55090909	divya@rptechindia.com	www.alteclansing.com
Artis	Kunhar Peripherals Pvt Ltd	022-56345758	salesbom@kunhar.com	www.artis.co.in
Creative	Creative Asia Labs	9840160005	india_getcreative@ctl.creative.com	in.creative.com
Frontech	Jupiter International Ltd	022-3095682	frontech@bom5.vsnl.net.in	www.jil-jupiter.com
Genius	Transtek Infoways Pvt Ltd	95250-3250072	amit@ttek.in	www.geniusnet.com.tw
Gigabyte	Transtek Infoways Pvt Ltd	95250-3250072	amit@ttek.in	www.giga-byte.com
Intex	Intex Technologies	011-41610224	info@intextechnologies.com	www.intextechnologies.com
Logitech	Logitech Electronic India Pvt Ltd	022-26571160	response@logitech.com	www.logitech.com
Philips	Philips India Ltd	022-56912332	pcp.india.info@philips.com	india.philips.com
Tech-Com	Shree Sagarmatha Dist Pvt Ltd	011-26428541	contact@techcomindia.com	www.techcomindia.com
Umax	Neoteric	022-39828600	sales@neoteric.co.in	www.umax.com
Xfree	Transtek Infoways Pvt Ltd	95250-3250072	amit@ttek.in	NA
Zebronics	Topnotch Infotronics Pvt Ltd	044-26616202	zebronics@zebronics.com	www.zebronics.com

# ONIMUSHA 3

The latest in Capcom's *Onimusha* series has finally made it to the PC after two years of providing health, happiness and demon-slashing joy to PS2 gamers everywhere. Time folds and crumples as modern-day Paris is suddenly overrun by the evil Genma, who were thus far content with terrorising mediaeval Japan. Samanosuke Akechi (played by Takeshi Kaneshiro from the movie *House of Flying Daggers*), a Samurai warrior from that period, also falls victim to these holes in time as he is transported to the present—just seconds before his face-off with Nobunaga Oda, the Genma Lord. Predictably enough, modern-day Paris sends its own representative—Detective Jaques Blanc (played by *Ronin* and *Mission: Impossible* star Jean Reno)—into the Japan of the past. With the help of Ako, a little fairy who can shuttle through space and time, you must now play as these two heroes and stop Nobunaga and his evil plans once and for all.

The game's story is rather mindless and predictable, but entertaining nonetheless.

There are also some dreadfully cheesy and mushy scenes every now and then, but they're quick and relatively painless. The cutscenes are well done, the weapons are great, and if you don't mind the button-mashing action, the gameplay is quite engaging too. Under ordinary circumstances, this would make for a must-buy game, perfect for the summer holidays when brain usage is at its minimum and all you want to do is save the world without thinking too much. But these (forgive the over-abused dialogue) are no ordinary circumstances.

The horrifying truth is, that Ubisoft—yes, dear old Ubisoft—have insulted this great game by a port that smacks of utter

laziness and general dunderheadedness. For one thing, the in-game help still refers to the old PS2 controls! So if you throw away the manual (who reads game manuals anyway?), you're sunk while you try to figure out which key is the equivalent of the triangle or the square. The keyboard layout couldn't have been more ridiculously designed by blind monkeys with learning disabilities. It took me half a day to get used to, and another three days to stop fuming over the fact that it took half a day to get used to. Of course, you *should* play this with a controller—the universal truth for all ports—but that's no excuse, really: there are a respectable number of ports out there that can be enjoyed even by keyboard warriors.

The graphics are sadly dated—the texturing should have been updated with some more hi-res maps, especially considering that the game *is* two years old. Thankfully, this is well offset by some well-executed character animations and action sequences.

Finally, this last act of blasphemy: if you've heard of *Onimusha 3* before, the subject of its intro sequence would have been broached, and not in vain—nearly six minutes long, it features Samanosuke Akechi as he single-handedly takes down a massive Genma tank as it moves to support Nobunaga. It is by far the most jaw-droppingly awesome game intro I've ever seen, and can easily hold its own as an incredible CG movie even without a game to support it. Appallingly enough, you don't get to bask in this extravaganza in the PC version of the game. Oh, it's not like it isn't included; it is—you just have to navigate to the game's directory to find it.

As a game, *Onimusha 3* is great. Yes, this despite a full page of animosity. Capcom got it right the first time, so even Ubisoft's rip-and-forget approach can't overshadow its solid dose of action—it's why it was so popular for the PS2 in the first place. ■

[nimish\\_chandiramani@thinkdigit.com](mailto:nimish_chandiramani@thinkdigit.com)

Rating: 6/10  
 Minimum System Requirements:  
 1.5 GHz Pentium 4 (or equivalent), 512 MB RAM,  
 128 MB Graphics Card (GeForce FX5700 or equivalent)  
 Developer: Capcom  
 Publisher: Ubisoft  
 Distributor: E-Xpress Interactive  
 Contact: 022-22850245  
 Price: Rs 1,299

# The Godfather<sup>®</sup>

## THE GAME

Welcome To The Family, Kid

“Godfather”... the word immediately brings to mind the movie, widely acclaimed as one of the greatest films of all time. Nothing captures the gritty reality of New York in the forties better!

When Electronic Arts (EA) announced the game, based on the movie license, gamers everywhere took notice! A risky proposition this—taking one of the most beloved Mafioso franchises of all time and making a game actually based on the film.

You play a character that was neither a part of the Francis Coppola film, nor of the Mario Puzo novel. However, the game does accurately follow the movie storyline.

### In The Beginning

You get to customise your gangster, which is a real treat, since you can fine-tune nearly every aspect, from hair style to eye colour and size, and even the dimple on his chin!

The game starts with a cutscene where you, as a kid, watch your father being gunned down by rival mobsters. Many years later, your mother asks the Don to take you under his wing (as a gangster wannabe of course). Hurrah—your life of crime has just begun!

### The Job Profile

You start off as a minor thug for the mob—an “enforcer,” carrying out various jobs for members of the Corleone family. While the game follows main missions that will further the plot, you are free to branch off into various side

missions that will come by you. There is also extortion money to be had and illegal rackets to be bought out or taken over. These range from gambling dens to brothels and even illegal importing operations. All this dough will be put to good use bribing cops and to further your Family’s influence.

### Being A Mobster Has Looked Better

One of major let-downs of *The Godfather* is the overall look—graphics-wise, the *Godfather* looks pre-2000ish. *Mafia*, another gangster-based game released way back in 2002 looked way better. The game also makes heavy use of texture recycling, which means you’ll be seeing a lot of identical-looking interiors and faces as well.

### Gameplay

*The Godfather* borrows heavily from the *GTA* series—right from the safe haven-style save points, to the senseless violence you can bestow on the many citizens of New York, and let’s not forget the crazy car chases! *The Godfather* doesn’t encourage you to play this way, though.

Missions are varied, and depict several parts of the movie accurately: like the Don getting shot, you play the part of the driver here and shoot (and drive) your way to the hospital.

The combat system is decent, simple and effective, though the hand-to-hand becomes a simple grab-and-button-mash after a while. Shooting is a straight lock-on-and-shoot affair. But overall, the combat is enjoyable simply because of the number of ways to finish baddies off! From baseball bats to Molotovs, you’ll use them all. Car chases are a tad boring since your car steers so well you may never get caught, even when you have to (pun intended)!

*The Godfather* has a level-up system whereby you get to improve your character stats, learn new abilities and such. It’s necessary to properly distribute those skill points ‘cause you’ll need them as the missions get tougher.

One problem here is the controls. The keyboard just cannot cut it—a controller is highly recommended.

### End Game

All in all a fun experience, *The Godfather* is a game you can spend a few hours playing. Dated graphics may put off some, but gameplay and voice acting make up for this to a decent extent. What really makes this one stand out is the way it clings to the actual movie storyline, and diehard fans of the book or film will absolutely love this game. ■

michael\_browne@thinkdigit.com

**Rating:**  
7/10

Publisher: EA games  
Developer: EA games  
Minimum system requirements:  
1.4 GHz or equivalent processor, 256 MB RAM, 5 GB hard disk space, DirectX 9.0c compatible graphics card and sound card  
Distributor:  
Gayatri Impex  
Contact:  
022-23870260





# THE LORD OF THE RINGS THE BATTLE FOR MIDDLE-EARTH

## It's here, Preciousssss...

Long days have passed since the first rumours spread from the West—*The Battle for Middle Earth* would begin again, this time with more fire than ever before. We clutched our swords in anticipation and excitement; finally, the War is upon us.

We live in boring times—the RTS (Real-Time Strategy) genre has grown weary now. Nothing revolutionary has happened in the area for many eons, with game developers relying more on theme and setting than concept. The need to innovate seems horrifyingly low when you consider that nearly all the gripes we ever had about strategy games have been addressed by now, and any RTS built with a little common sense is perfectly enjoyable.

### Middle Earth

As with all the recent *LOTR*-based games, *Battle For Middle Earth 2 (BFME2)* is

truer to the movies rather than the book, and so, takes the same liberties with the plot that the movies did. Still, there's nothing here that counts as blasphemy by any standard, so fans will be content with shutting up and just enjoying it. Middle Earth has been set up beautifully—the atmosphere is exactly what you would expect from a game based on the movie. You're going to need a graphics card infused with some elven magic to truly take in these wondrous lands—my NVIDIA 6600 started crying for mercy when I turned up the settings to High at 1024 x 768 and will probably go on strike if I try the Ultra High settings at 1280 x 1024. Even at Medium, though, it's one of the best-looking games we've seen.

The game follows the many battles that took place in the book (and its appendices), including the two legendary confrontations at Helm's Deep and Minas Tirith—which will now go down in history among the greatest RTS missions of all



time, courtesy EA. In the Good campaign, you will be in control of the races of Men, Elves and Dwarves, purging evil from Middle Earth, with the aid of Heroes like Gandalf, Glorfindel, Arwen and many other familiar faces.

There's also the Evil campaign, which lets you squish all those *nasty hobbitses* and elves into the ground and spread Darkness in the land—more enjoyable than you'd think.

### Draw Your Swords

*BFME2* won't win any awards for revolutionising the concept of the RTS—the job description is still the same: gather resources, build units, guard base, poke enemies in the eye; repeat as desired.

What we should give EA a pat on the back for is breaking away from the standard control-panel-at-the-bottom interface that's become so tired, and making an interface that's incredibly intuitive and convenient.

Another welcome addition is the Planning Mode, which lets you pre-issue commands to all your units and then make them all execute at the same time.

*BFME2* is a game that encourages you to get out there

and fight your enemy tooth and nail—as your units gain battle experience, they will gain more skills that you can have them use in battle. The magical powers of heroes, too, only come with more fighting experience. You will be rewarded for being aggressive with Power Points, which you can then trade in for powers, like the ability to shroud your troops in mist or cause devastating earthquakes.

### All Hail The Dark Lord

In the skirmishes, you can hunt down Gollum on the map (not an easy task, mind you—he's slippery) and kill him to make him drop the One Ring. This is a highly recommended activity, for your opponent will also be alerted of the dropping of the Ring—and all hell will break loose as you try to bring it back to your base safe and sound. If you thought that an RTS could never give you a rush of adrenaline, this should make you feel pretty silly.

If you manage to bring the Ring back to your camp, you can summon either Galadriel if you're on the good side or the Dark Lord Sauron himself if you've sided with evil—both (obviously) immensely powerful.

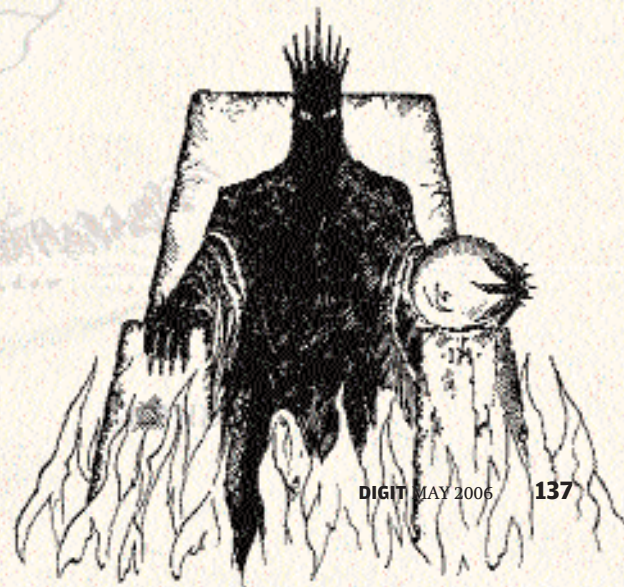
Summoning Sauron will probably guarantee you a clear win unless you manage to botch up your game *really* badly. Being the Dark Lord and everything, he will inspire fear in the opposing camp, causing inexperienced units to run like chickens. As he saunters across the map, he will decimate armies in a sneeze, bring down walls more easily than we crush Styrofoam, and will leave your opponent (human or AI) crying like a baby. One unit was never this much fun.

### Slaves Of The Ring

Fans of *The Lord of the Rings* are going to love this game. Every aspect of the gameplay makes perfect sense in the context of the book. Take away all the LOTR magic, and *BFME2* still holds its own as a solid strategy game with a great interface and devilishly nasty AI.

One fair bit of advice: when you go out and buy it (which you must), try and find the DVD—the copy we got for review was (God help us) a 6-pack—for beer that's fine, for CDs, atrocious.■

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## Europe Isn't Quite San Fran

San Francisco's mayor had declared a few months ago that Wi-Fi was a fundamental human right. In contrast, the EU recently announced that the universal service obligation, which currently covers landline telecoms, won't be extended to cover broadband and mobile services



## Your Laptop Or Your Life!

Just a week after it was announced that plans for free wireless broadband for San Francisco residents were finalised, laptop thefts at wireless cafes rose. Coffee-houses, restaurants, and digital cafes—once digital sanctuaries—are now a hunting ground for thieves



# Escape

## COULD-DO-WITHOUT RESEARCH

# What's He Doing Up There?

If you've ever been to a classical concert—or watched one on TV—you've probably wondered what the conductor is doing, prancing about the stage and waving his arms. Now, a research project is aiming to find out what reactions a conductor's actions translate into—in the musicians, and in the audience. Conductor Keith Lockhart, five Boston Symphony Orchestra musicians, and some audience members were involved in the experiment in mid-April, at a concert featuring the overture to *The Marriage of Figaro*. Lockhart was wired up with sensors that measured his heart rate, muscle tension, and so on. Five musicians were wired to measure how they reacted to Lockhart's conducting. Some members of the audience wore sensors so the scientists could tell



Illustrations: Harsho Mohan Chatteraj

what kinds of emotional intensity they were feeling.

Teresa Nakra, a former MIT doctoral student, was one of those involved in the experiment. She said similar experiments in the past had shown that conductors' gestures are

based on their emotions.

Huh? Couldn't we have figured that out without elaborate experiments involving sensors?

"I think a lot of people wonder what the conductor accomplishes standing up there," Nakra said. The sensors are worth \$80,000, and Nakra and her colleagues said they were expecting to answer that question.

Again, huh? If people are wondering, why not ask the conductor and the musicians what's going on up there?

We're seeing more and more such useless research these days—if the tech is there, use it somewhere! What's next? Research to see

## Whatever Happened To...

### VRML?

Interactive 3D on the Web? Imagine being able to take a virtual tour of your renovated house *before* the actual renovation; being able to move stuff around willy-nilly on the slightest whim. What if you could check out merchandise from all possible angles in a virtual shopping mall?

All these wondrous abilities, and many more, were promised to us via VRML—the Virtual Reality Markup Language—which became a buzzword in the first crazy days of the World Wide Web. So why aren't we roaming virtual malls and throwing virtual vases around?

VRML went flat for two reasons: the first is the VRML browser wars—different browsers expected VRML to be written in their own special way, so compatibility was almost non-existent. Secondly, hardware wasn't ready for ubiquitous 3D just yet, so having it on the Web wasn't going to achieve much anyway.

But VRML isn't dead yet—the Web3D consortium is giving it a new avatar—the X3D specification, which also makes use of browsers' XML Parsers to create 3D objects on the web. It's still in its infancy, but is rising quite strongly. It's a standard, so we won't witness any new browser wars—and with OpenGL being supported on nearly all modern PCs, hardware isn't an issue anymore, either.

Right now, X3D is being used for CAD and educational purposes, and will hopefully make its way soon into more applications we can *all* enjoy.

## Win! My Desktop Contest

This month's winner is **Debangshu Sen** from West Bengal. Here's what he used:

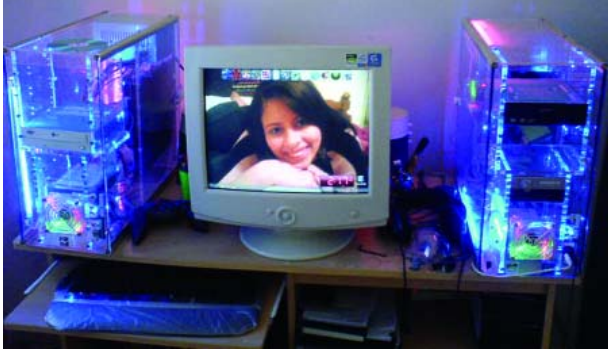
- ☑ Chameleon Clock 3.5 for the floating clock
- ☑ IconPackager 3.1 for the desktop icons
- ☑ DesktopX 3.10 for the Email Object
- ☑ Sun & Moon on Screen v1.0
- ☑ Start Killer 2.3 to remove the start button
- ☑ Hide Window Now v2.5 to hide the system clock, icons and taskbar notification area
- ☑ AlphaXP 1.1.2 to make the taskbar transparent



Send your desktop with an exact description of how you made it to [mydesktop@thinkdigit.com](mailto:mydesktop@thinkdigit.com) with the subject 'My Desktop' and tell us your postal address, too.

## DigiPick of the month

Takes  
Two To Tango



This month's winner is  
**Saiyad Haider J**  
P.C.-114, P.O.Box-470  
Jabroo,  
Sultanate Of Oman

**He wins**  
**S.U.M.O**  
(Shut up, Move on)  
by Paul McGee

Published by  
**WILEY-INDIA**



### WIN!

Send in your entry and you could win an exciting gift just by sharing an amusing picture with a tech angle to it. The picture should have been shot by you, and should not have been published anywhere earlier. E-mail your picture with the subject 'DigiPick' and your postal address on or before the 15th of this month to [digipick@thinkdigit.com](mailto:digipick@thinkdigit.com). One prize-winning picture will be published each month.

whether a person's heartbeat increases upon seeing a cockroach? How about finding out whether a man's gall bladder increases its secretions upon hearing of an impending visit from his mother-in-law?

Lockhart is "not interested" in using the results of the research to rate himself: "I prefer the old-fashioned way of doing that—hearing a sharp intake of breath from the audience... I'm an analogue guy in a digital age."

If this is what the digital age means, perhaps we're all better off being analogue...

**WILL THEY TAKE OVER THE WORLD?**

## Armed Robots!

This is not the first time we've come across news of the sort that makes you feel the end is nigh, but

it's different: we're actually placing the guns in their hands. The robots', that is.

US troops have been doing some creative tinkering with the robots that help them in Iraq and Afghanistan: they've modified them to carry grenades and other weapons into buildings and other potentially unsafe targets. The military has not been unresponsive to these experiments: the Pentagon is now testing a new version of the Talon robot that carries a remote-control M-240 machine gun!

It turns out much larger robot weapons are also in testing, including a tank-like vehicle called the Gladiator, which can fire guns, tear gas or almost anything else.

These armed robots fire only with human command. But can the next step be far behind? More independent robots that decide by themselves when to fire? Now here's the scary part: having robots fight without

human control is "not a technology issue, so much as it's a safety issue," says Scott Myers, president of General Dynamics Robotic Systems. In other words, we already have most of the technology, and just need to work out how to keep it safe!

A robot can find a human with its sensors and kill the person, but "we don't want to shoot our own people or children," Myers says. It's hard enough for a human to distinguish between friend and foe, and far as the robots are concerned, "we're a long way from being there." Thankfully! Imagine newspaper headlines that said "Robot takes control, kills sergeant, four marines!"

**JUST 272 SONGS**

## The RIAA's Getting Obnoxious

A student at MIT says the RIAA has "told her" to drop out and work to pay her fine for illegal downloading of songs! Sometime in December of last year, physics major Cassi Hunt, 20, learnt that she was being sued by the Recording Industry Ass. of America for illegally downloading 272 songs. MTV.com recently reported. Hunt hasn't admitted guilt, though.

The Ass. offered her a deal to settle the suit for \$3,750. But in addition to loans for her \$42,000 annual college expenses, Hunt said she makes only about \$5,000 a year working in between studies.

## People Who Changed Computing

### Programming Pioneer

Programming would probably have been very different if not for the contributions of Edsger Wybe Dijkstra. He was the first to bring about the concepts of



Edsger Dijkstra

structured programming synchronisation, stacks and vectors, which are used in virtually all of programming today. He was one of the creators of the Algol 60 compiler: this was the second high-level programming language compiler, and became the reference for all future compilers.

Born in 1930 in The Netherlands, Dijkstra completed a PhD in Computer Science from the University of Amsterdam. During that time, he created a highly efficient "shortest path algorithm," which finds application in communication and electronics problems. In 1968, Dijkstra published his famous *Cooperating sequential processes*, the essay that kicked off the field of concurrent programming. Here he discussed the notion of mutual exclusion, and gave the first solution to the mutual exclusion problem for two processes. Further, he proposed the first synchronisation mechanism for concurrent processes, the semaphore.

Dijkstra received the ACM Turing Award in 1972. He was an exceptional writer, having written 1,300 works on computing—mostly on his typewriter, and later on, using his Mont Blanc fountain pen! His works were later digitally scanned and are available for reference to this day.

Dijkstra often spent vacations travelling with his wife in his Volkswagen Bus. He died in 2002, leaving behind research of unmatched depth, clarity and originality.



# Bluff

YOUR WAY THROUGH

## Hack Attacks

Ever been tongue-tied thinking up explanations for why your PC has been brought to its knees? Here's a favourite excuse/genuine reason: it's been hacked! But how? What kind of attack is it? Were there swords involved? Take your pick:

**DDoS:** A Distributed Denial of Service attack is carried out by flooding servers with data till they're crippled and can't service genuine requests. A popular method is the dreaded Ping of Death—pinging a server repeatedly from different sources. Most Web sites are still quite vulnerable to this type of attack, and it's a general favourite among those with malicious intent.

**Trojan Horse:** A program that comes disguised as something harmless, even useful, but really opens up access to a computer, making it a participant in a DDoS attack, or making it possible to use it to attack other computers.

**Worm:** True to their biological counterparts, worms keep consuming system resources, slowly overloading the system and finally causing it to cease functioning.

**SQL Injection:** Nothing like a flu shot, this is a technique whereby SQL commands are passed through a Web application so they get executed by a backend database. One of the most common application-layer attacks currently being used. To be able to perform SQL Injection hacking, all the attacker needs is a browser and some guesswork to figure table and field names.

**Cross-Site Scripting:** Called XSS or CSS, this is a security exploit in which the attacker inserts malicious code into any link that appears to be from a trustworthy source. When you click on the link, the embedded code is submitted as part of your Web request and can execute on your computer, possibly (and usually) allowing the attacker to steal information.

## Things Get Hot

A couple of empty threats and (surprise, surprise) a rainy day later, Mumbai's oppressive summer is finally upon us. And because power must be conserved, our best friend the AC must rest on Fridays, according to some crazy law being aggressively enforced by the MSEB. High-horse alert: a lot of us being Bombayites, this hasn't gone down too well with us. But we've lowered our standards, and have elevated the once-ignored fan to a status higher than one's closest family members. Accusations were exchanged ("You stole my fan!" "Only because you stole mine first!"), friendships torn asunder, blood spilled, and heat-crazed employees of JDM ran the halls willy-nilly heralding the impending destruction of the Earth.

If it isn't the heat driving people crazy, it's the fact that our fifth anniversary is

**DIGIT DIARY**

coming up—Ed Deepak is already biting his nails at the prospect, and it is we unfortunate souls who must suffer ("Faster! We need to get ready for June!"). We seem to be headed for some really hard work for said issue, which only translates into sweetness and joy for our readers, so earmark some money from your piggy banks for... *The Big Bumper June Issue With Bells, Whistles, Clowns, Flaming Arrows, Three Monkeys, Twelve Pumpkins and a Chicken!* (Working Title)

Visual relief was provided this month by the models we auditioned for this month's cover ("There are Models in here? Female Models?"). To cut a long story short, the photography studio will be investing in stronger locks soon.

Yes, we're quite shameless here, and we're not in the least ashamed to admit it.

Hunt then tried to negotiate a lower figure with a representative, who told her it was not negotiable. The rep suggested she drop out of MIT and attend a much lower-priced community college, and get a real job to pay her fine. "I was flabbergasted," Hunt said. "I started laughing at her and said, 'You cannot be serious!'"

Hunt is trying to raise the money via several means, including a Web site, ScrewPirates.com. Shouldn't that have been "ScrewTheRIAA.com" or something of that sort? We're sure that would attract more potential benefactors!

Makes you feel you're lucky to be living here in India, where software is effectively free for most people, where there's no RIAA, and where the police don't have a clue about what "illegal file sharing" is!

LITERALLY

## Make Love, Not War

We've heard about flirting and dating in online games such as *EverQuest* and *World*

*Warcraft*, sometimes even leading to marriage between players, despite no romantic or sexual features in these games. And we've also seen single-player sex games such as *VirtuallyJenna*, where you basically do sex-oriented stuff all by yourself. Now, a new crop of adults-only games will combine the player-to-player interaction of online games and the graphic sexuality of single-player sex games!

In *Naughty America: The Game*, set to launch soon, players will take on the forms of sexually appealing—albeit cartoon-like—people who meet, flirt and have sex with other players. And in *Red Light Center*, a game available in test version, players are 3D characters in a red-light district. They can talk to each other through headsets.

Sex sells, but will these games? That, according to those in the industry, is not a given. Sure, these games combine all the elements that go into online success—interactivity, immersion, realism, and, of course, sex. But how many people want to have sex online?

It's not clear. For one,



online sex seems to us to offer no extra titillation over what people get from single-player sex games. Now, what's been called cybersex—sexually-oriented online chatting—is, of course, hugely popular. But the reason is that it tickles the imagination. How will simulated sex in a game help? Of course, one can argue that chat—including voice chat—is included in the games, and that the actions people do augment that chat. But we think that augmenting the chat is the only thing the rest of the game will accomplish.

One thing is clear, though: if cybersex can be considered cheating—and

## whatweretheythinking.com

### www.berling.nl/seventies/

A glance at [www.berling.nl/seventies/](http://www.berling.nl/seventies/) and “why?” and “for whom?” immediately pops up: it’s just images—and not hi-res at that! Granted, the seventies must have been an interesting era, but information on the period and its trends could have been helpful. Unfortunately, this is not to be. All the site has are pictures, more pictures, and even more pictures from the seventies. An entire page’s length of pictures categorised under such sections as Cars, Fashion, Film and TV, Furniture, Houses, Posters and so on.

The thumbnails can be enlarged: “Click an image to enlarge,” we’re encouraged. However, a click opens the images in a new page in just slightly larger dimensions! Nothing remotely useful about the stuff in the images is mentioned, either; it’s just pictures, you see! Some of the things in the pictures are good keepsakes from the seventies,

[www.berling.nl/seventies/](http://www.berling.nl/seventies/)

and it would have been cool to be able to order the stuff. But this is not to be, either—remember the mantra: just pictures!

Many of the pics are repeated—fourteen (whew!) pictures of the “ball chair,” and we’ve lost count of the number of featured images from the TV show *Barbarella*.

A link at the bottom of the page leads to something called “Futuro house”—a house that had been designed (in the seventies, of course) for the future, but which never became popular. The page has promising links to different versions of the house, but our elation was deflated when we found that, well, the links don’t work. And don’t even get us started on good site design practices.

Whatever it was designed for, this page is, unfortunately, *not* a window to the soul of the seventies. If you’ve heard your folks talk fondly of that time, make sure they never get here!

even grounds for divorce, game sex online will be considered much more so!

### THE UPPER CREST

## \$400 A Month For E-Mail

For a little less than \$400 a month, you can proclaim your financial status in the digital world. Millionaires24.com, owned by Munich, Germany-based Netlite GmbH, is calling on those who consider themselves as making up the upper crest of society to sign up for one of their exclusive e-mail accounts—thereby rising above the cheapo crowd, who go with free e-mail.

The company’s Web site asks, “Do you own a luxury car and enjoy the exclusivity? Of course... But why restrict yourself? With an e-mail address at Millionaires24.com, you will show all your e-mail

recipients that you have made it!” And then there’s this gem: “An ordinary person cannot afford \$399 per month for an e-mail address.” Now that’s all neat and spelt out for you!

Proprietor Christian Mader believes the time has come for a service like his, which the Web site compares to a “virtual diamond ring.”

“There are so many people out there who want to show their status and their wealth on the Internet also,” he is reported to have said. “m24 is the best shortcut to communicate financial status.”

So what do you get with an m24 account? Nothing much, except for unlimited e-mail and sundries like a date reminder. It’s all about the status symbol value, of course.

To guarantee exclusivity, only 10,000 memberships are available. We’re sure that number will go up—why should Mader limit himself to \$4 million a month for such a wonderful idea? ■



## Blog WATCH

**Google’s calendar service is out, and blogs are abuzz with this bit of news. Newspapers are catering to newsbots. ESP is now also the acronym for a mind-reading device. And a reader muses over what the end of blogging might mean**

### Ryan Oakley

<http://snipurl.com/paxg>  
(<http://thegrumpyowl.blogspot.com/2006/04/mind-reading-machine.html>)

### Mind reading machine

The good people at MIT’s Media Lab have invented—seriously—a mind reading prosthetic device. It’s called the Emotional Social Intelligence Prosthetic. But don’t worry there’s an acronym. ESP...

So far the major application is for high functioning autistic people but MIT has repeatedly been asked if it can detect flirting. I can save everyone at MIT a bit of time here. There’s no need to program that into the machine. If you’re wearing a mind reading device on your head no one is flirting with you.

### Angel

<http://snipurl.com/paxn>  
(<http://gypsylibrarian.blogspot.com/2006/04/what-if-bloggers-vanished.html>)

### What if bloggers vanished?

From Boing Boing, a tale of what would happen if bloggers actually disappeared. The story is “Plumage from Pegasus” written by Paul DiFilippo. I found myself speculating what if the various obstacles of spam, excessive regulation, viruses, and terrorism did bring down the Internet. At any rate, an interesting read. I wonder what would I do if the Internet disappeared, and I could not blog anymore.

(*Plumage From Pegasus* is located at [www.sfsite.com/fsf/2006/pdf0602.htm](http://www.sfsite.com/fsf/2006/pdf0602.htm))

### Clive Thompson

<http://snipurl.com/paxm>  
([http://www.collisiondetection.net/mt/archives/2006/04/how\\_google\\_news.html](http://www.collisiondetection.net/mt/archives/2006/04/how_google_news.html))

### Google News influences Newspaper headings

To try and entice the search-engine bots of Google, Yahoo, and MSN, newspapers are beginning to alter their prose style. One of the biggest areas of change is headline-writing. Normally, a headline writer tries to use some witty wordplay to attract readers, but such nuances are totally lost on machines. A bot is trying to quickly figure out the content of an article, and wordplay just gets in the way...

Granted, most of the newsbots out there are a little more intelligent than that. But not always.

### Dave McClure

<http://snipurl.com/pb14>  
([http://500hats.typepad.com/500blogs/geeks\\_tech\\_star\\_tups/index.html](http://500hats.typepad.com/500blogs/geeks_tech_star_tups/index.html))

### Google Calendar (aka ‘CL2’) is alive

Looks pretty sweet...Nice integration with Google Maps too... I didn’t even put in a street address, but it still figured out the general area.

Hmmm. Think I’ll spend some more time investigating this one. Could be worth the switch.



### Digit Pre-empts

I've been reading *Digit* for a long time, and it's a big coincidence that when I wanted to buy a graphics card, you gave ratings in last year's September issue. Now that I want to buy an LCD, you've again provided me with the ratings! Many thanks!

**Aum Ravi**

Dear Aum,  
Call it co-incidence or call it our pre-emptive nature, but you're not the first to have written in to us with something like this! We're glad to have helped you with your purchase decisions, and it's our constant effort to continue to do so. Thanks for writing!

—Associate Editor

### Nerd From Nagaland

Dear Ed,  
Though I'm not a subscriber, I've been reading your magazine for the past five years, and have never missed an issue. I wish to thank you and your wonderful team for bringing out such a great magazine, which has helped me tremendously—from tweaking my PC to making decisions when buying hardware or software. As I'm from Nagaland, it is sometimes difficult to get any professional help, during which your wonderful magazine comes to my rescue.

**Alo, Nagaland**

Dear Alo,  
We value all the correspondence we receive from our readers, but it's especially letters from readers like yourself—who live as far away from here as Nagaland—that keep us on our feet and make us strive to deliver the best. All the best with your tech journey.

— Associate Editor

### Anniversary Wishes

I've never subscribed to *Digit*, but believe me, I've never missed an issue. I was the only reader of your magazine for more than four years in my town, as my bookseller told me. Now my aim is the second one. You celebrated your first birthday, and every copy was sold out—but there was more demand. "Hardware Unlimited" added more to your next birthday. You upgraded the third year, and gave us a glimpse of the last 36 months of your life. Your magazine was a hit that year, but you beat everyone after saying "Hello Convergence!" I'm a forgetter, but unbelievably, I remember your birthday.

The *Fast Track* series keeps me one step ahead, and is part of my personal library—along with a huge digital library. I get information on new trends in the IT industry, about new technologies, and a lot more from various newspapers, e-newsletters and news channels. But you are the technology navigator I trust most. In February of this year, I heard about The Entertainer in *Click* on BBCWorld, and two days later, when I bought a copy of *Digit*, my dream came true when I read about the same thing in *Geek Dreams!* Are you omnipresent?

I dream of Robotics, Search Engines, and Animation in the *Fast Track* series in the coming months, and Blu-ray discs instead of CD/DVDs in the coming years. No one has noticed, but a team like yours plays a vital role in boosting the IT growth rate in India. What George Lucas gave the new generation with the *Star Wars* trilogy, you are giving with *Digit*. All of us, your readers, want your performance to be *todu fodu* and *dhamakedar!* Finally, wish you a very happy birthday, and here's a suggestion—remember only one thing: the law of the Survival of the Fittest!

**Sarabpreetbaljinder Singh Isher**  
Rajouri

Dear Sarabpreetbaljinder,  
Thanks, and thanks again, for the encouraging words! Look out for a really special fifth anniversary issue. And no, we won't forget about Survival of the Fittest—it's a vital part of the game!

—Associate Editor

### Letter wish Granted

First of all, please, please and please publish this letter in *Digit's* latest edition. Second, my congratulations to *Team Digit*

for maintaining their #1 position. Now, last month's *Fast Track to Linux* was absolutely fantastic. *Digit* is one of the best things to have happened in my life. But, I have a complaint: neither my name nor my solution was published in last month's *Take a Crack*. I had suggested removing the path to a drive through the Disk Management Tool.

The *Digit CeBit Special* was awesome, especially IBM's Cell Processor.

*Digit's* extreme devotion to its readers is what has made it stand on top since its first edition. *Digit* will always remain *Digit!* and maintain its own identity in this competitive world.

Now time to ask for help. I have XP Pro SP2. I wanted to make my XP look like Vista. I found a customisation pack called "Pack Vista Inspirat 1.1," available for download from softpedia.com. But it was 26.7 MB, and because I don't have broadband, I was unable to download it. *Digit* readers and computer geeks would definitely appreciate your efforts if you could bring out the customisation pack in future editions of *Digit!* I would also like to ask why my PS/2 mouse won't work with the DSL Live CD.

**Pratik Sinha, Patna**

Dear Pratik,  
We have no idea why your PS/2 mouse didn't work with the DSL Live CD—we haven't heard of such an issue before; we'll look into it, and if we stumble upon something, we'll get back to you.

Second, because it's hard to find standalone packs that aren't filled with malware (spyware, adware, worms, trojans, etc.), we've decided to be extra careful by stopping the inclusion of all desktop enhancement packs in our DVD and CD. We're only trying to protect you with this decision.

—Associate Editor

### Fast Track Archive

The April issue was really stuffed with great information. The *Fast Track to Linux* is truly meant for Linux enthusiasts. *Life In A USB Nutshell* was the topic I liked the most. Thanks for the cool job! All the issues of *Fast Track* I have are really very informative.

I've been a reader for the past two and a half years. But I missed the Jan and Feb 06 issues. I read in the April issue that you provided the soft copy of all the *Fast Track* books on the Jan DVD. My humble request: please provide all the *Fast Track* issues that have been

## Write to the Editor

E-mail: editor@thinkdigit.com

Snail Mail: The Editor, Digit, D-222/2, Om Sagar Building, MIDC, TTC Industrial Estate, Nerul, Navi Mumbai 400 706

Digit will publish the best letters on these pages. Letters may be edited for clarity. You must include your complete address in all communication.

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# Inbox

LETTER  
OF THE  
MONTH

made till date in the next issue or in a forthcoming issue.

**Himanshu Pant**  
Pithoragarh, Uttarakhand

Dear Himanshu,  
Naturally, we're glad our *Fast Track* series is being appreciated. We'll certainly be providing all of them again in one of our future issues, as we did in January 2006.

— Associate Editor

## Call from Mauritius

I'm a BBM final year student studying in Bangalore. Actually, I'm a foreign student, from Mauritius. I would like to congratulate your team for all the efforts they've put in to create such a good magazine. My stay in India will soon be over, and I've been buying your magazine since around July of last year. I've gotten hooked! I keep waiting for each next issue. The problem is, back home in Mauritius, I won't be able to get your magazine; is there a subscription scheme for me to apply to? Please help!!

**Ponnusami Vishwen Pazani**  
Bangalore

Dear Ponnusami,  
Thank you for the praise you've heaped upon us! We appreciate your efforts in writing to us on such a congratulatory note. Few people take the pain to praise and appreciate others—you're one of them. As for a subscription in Mauritius, unfortunately, we do not have an international subscription scheme as of now. But you can tell your friends to mail you the DVD, which contains the soft copies. (Almost every six months, we give out the past 12 issues of *Digit*).

— Associate Editor

## Troubleshooting made easy

First off, let me thank you for the wonderful issues that you bring out each month. I have some requirements regarding my career. I am a second-year engineering student (IT) from Gwalior. I have to submit a project catering to Industrial needs. I want some ideas regarding the same either in hardware or software or Web-based. If you do have some ideas, please let me know via e-mail: I cannot wait for the next issue. I want the coding too, in case of software (preferably programming in C++). I also needed information about companies who take in freshers for summer training in their firms.

Now regarding the magazine, this June, it will be your fifth anniversary. I'm

congratulating you in advance. You will be giving out many goodies, so I want that you should give a full mission-based game—like *Tomb Raider* or *Resident Evil*.

I want to thank you for the *Fast Track to Troubleshooting your PC*, with the help of which now I can solve 99 per cent of my problems.

**Sandeep Ghosh**  
Gwalior

Dear Sandeep,  
We're always listening to our readers—we've already responded to your letter via e-mail. Regarding what to give out with the June issue, we haven't finalised yet, but rest assured, you will like the contents.

— Associate Editor

## Linux Lover

I have been a *Digit* fan for the past four years, and I've seen the magazine growing at a great pace. I owe you guys a lot for my tech knowledge. I liked the April edition a lot. The *Fast Track to Linux* was something I was expecting for a long time. Having experimented with Linux few times and ending up with some problems, I still never lost interest in Linux, but I felt something was missing. After I read the *Fast Track*, the void was filled, as it were, and I'll now start experimenting with Linux again. The article on gaming was also good.

I am aware that Jasubhai publishes a gaming magazine called SKOAR!, which provides posters of games. Can't you, too, provide game posters, at least in special editions? Can you also provide a *Fast Track* on PHP and other such commonly-used scripting languages? It will be helpful to most *Digit* readers, because even if the number of developers is comparatively low, there are lots of people with blogs. I am sure it will help them too. Thanks!

**Sujith Tom Abraham**  
Kerala

Dear Sujith,  
We have already considered a *Fast Track* on programming and scripting languages—we also think it's a pretty good idea. As far as game posters are concerned, as I said last month, we are definitely mulling over it and trying to get the official consent from some game developers for it.

— Associate Editor

## Broadband Blues

Firstly, hats off to a great magazine! I have always been an avid reader, especially of the editorial and feedback, which discuss relevant and pertinent issues. I would like to highlight an important issue pertaining to BSNL broadband subscribers. BSNL is following an incorrect procedure for billing its broadband subscribers. I recently bore the brunt of the same in the month of February, when I was over-billed. BSNL follows a practice that is so inherently wrong that I wonder why no one has realised it yet... I guess you know that BSNL offers you free downloads between 0200 and 0800 hours.

But they don't bill you for the actual time of the download, even if you schedule your downloads for between those time points—but if you stay online for 24 hours, they bill you for 24 hours.

Say I log in at 0000 Monday, and log out at 0000 Tuesday. I schedule my downloads for six hours, between 0200 and 0800 Monday. I download 240 MB in the six hours. BSNL says only  $240/24 * 6 = 60$  MB is free, and they CHARGE SUBSCRIBERS for 180 MB. This is shocking, and if this were the US or any other country, it would have resulted in a class action suit. This method must be netting them crores of revenue from unaware, innocent and policy-abiding customers. This needs to be stopped, and if necessary, we should pursue BSNL to come clean.

So much for "broadband"—looks like BSNL still follows the dial-up mentality.

Your feedback is welcome, and I hope you publish this so that other readers are aware and get together to correct this unfair practice for the overall benefit of everyone involved.

**Abhishek Banerjee**

Dear Abhishek,  
We know that broadband billing is unfair in the case of some companies, and just so they listen to you (and to other readers who have the same complaint but didn't write in), we're making yours the Letter of the Month. We hope BSNL sits up and takes notice, possibly resolving your issue and/or clarifying what is going on.

— Associate Editor

# Tabloid TECH

People And Events That Grabbed Headlines—For Better Or For Worse

## Of Souls And Moms-In-Law

These have to be the funniest “we-found-this-on-eBay” so far. A Chinese man tried to sell his soul on Taobao, China’s top online auction site. He attracted bids from some 58 potential buyers before the posting was brought down, reports China Daily. The reason? According to a spokesman, they wanted more proof that the seller could provide the goods.

Then there was this bloke called Steve Owen who

published a photo of his 50-year-old mother-in-law under “Collectables And Weird Stuff,” listing her as “used.” He invited bids starting at just £1 (Rs 80). Steve was “deadly serious”: “She comes to the house every day trying to change me and make me tidy. I just hope someone will take her off my hands. She’s single and not bad looking.” Now you know what to do when your mom-in-law gets on your nerves—check ebay.in’s policies on this, though!

## Graves Come To Life!

A Dutch inventor has developed a digital tombstone with an LCD display. It has an infrared sensor that activates the display when someone stands in front of the grave. Then, the screen lights up with messages from the deceased, along with videos and pictures. Of course, you can make the thing do whatever you want—it’s more of an idea than an invention.

Henk Rozema came up with the idea after he made a DVD of his own life to show at his birthday party. A lot of his friends asked for copies of the DVD, and Rozema had a eureka moment. He thought he had died and gone to heaven, and thought up the digital tombstone. “I’m an engineer and I

thought that must be possible,” he is reported to have said. “We are not the Flintstones. This is the digital age!”

Indeed. We think it’s a cool idea. How boring are gravestones that do nothing but indicate dates and names?

There’s a little hitch with the whole concept, though. The deceased doesn’t know what’s being showcased on his grave, so suppose a vengeful family member put up photos of him with pie on his face—or something along those lines? How about some nice embarrassing videos? Sort of kills the gravity of the situation, if you’ll pardon the horrible pun. So do the dead have rights? Calling all American lawyers...

## Two Million Hits And A Threesome

You know we’re well and truly in an online world when your girlfriend links sex to page hits. A certain girl called Allison told her boyfriend Jim that she’d agree to a ménage-à-trois if he managed two million page hits on his site. She’d bitten off more than she could chew, as it turned out.

You know we’re well and truly in a mad, mad world full of boredom and decadence when that Web site actually gets two million hits and more—just so some random guy can have sex with two women at once—courtesy word-of-mouth, forwards, and mentions like this one here! Well done, mate, and good luck!



Head to [helpwinmybet.com](http://helpwinmybet.com) for the details... last we checked, a forum had been added. In fact, the site seems to be a hub of activity, but an angel warned us not to click any of the links on the site.

## Royal Mail

HRM Queen Elizabeth II was already online in 1976, when the Internet was still ARPAnet, we learn from her official Web site ([www.royal.gov.uk](http://www.royal.gov.uk)). You can find there a list of 80 facts about the Queen released by Buckingham Palace to mark her 80th birthday on April 21, which, interestingly, is officially celebrated in May or June, depending on country!

Fact #53 simply states, “The Queen sent her first email in 1976 from an Army base.” Not much detail there—what the mail was about, or why it needed to be sent.

Also in the list of 80 facts is this one: “The Queen is a



keen photographer and enjoys taking photographs of her family.” No mention here about whether HRM has gone digital...!

### 3-Easy-Steps to Freebies!

- 1 Log on to [www.thinkdigit.com/digitpatron](http://www.thinkdigit.com/digitpatron) to register.
- 2 Enter this 16-digit code and score points (you will find your code at this place every issue)
- 3 Your points get added every month and can be redeemed for exciting gifts!

